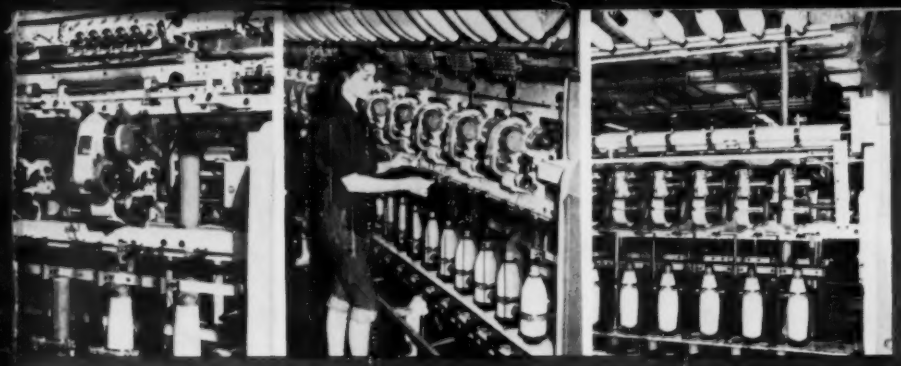

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TEXTILE WORLD

JANUARY, 1961
PRICE $1.00

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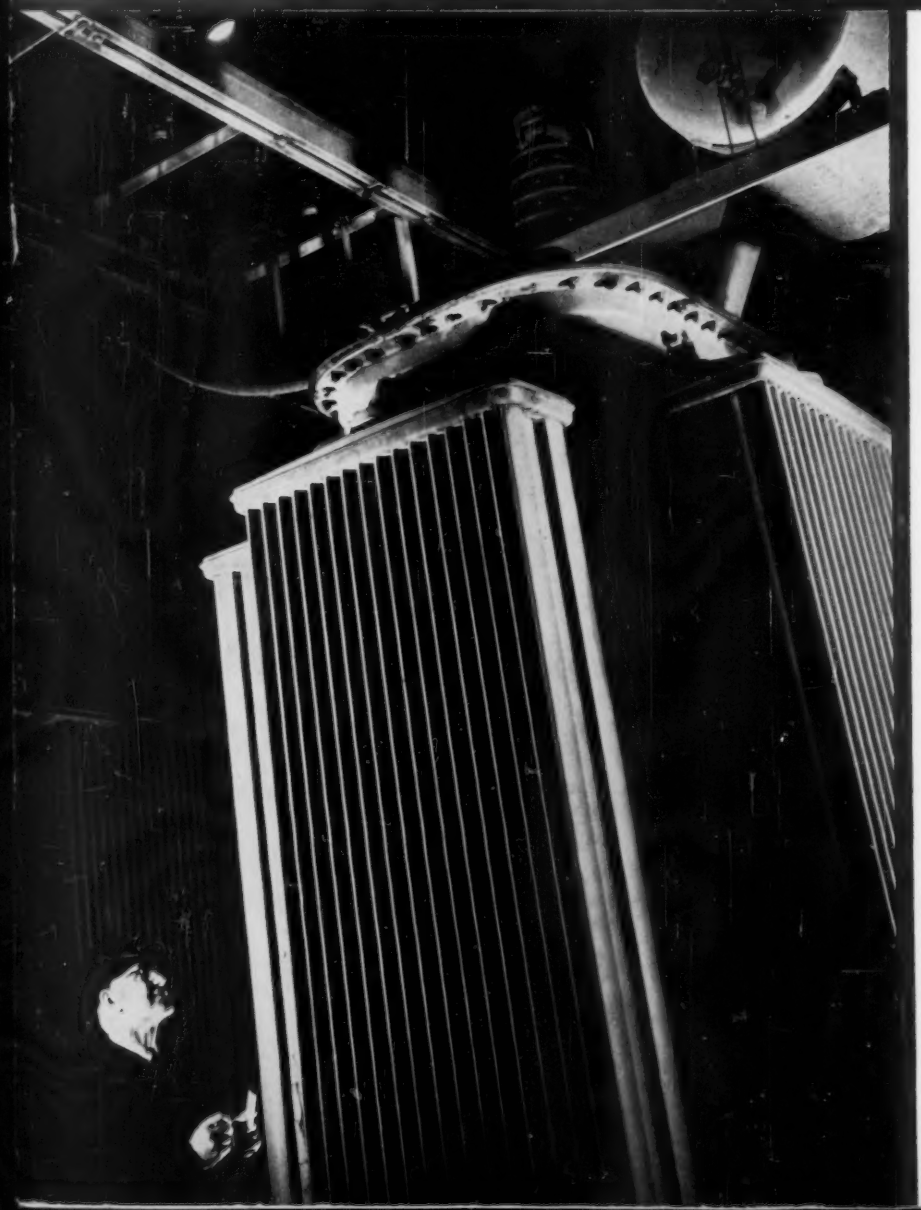

Special Survey: Electric Power In Textiles: 1961
(plus 9 pages of help for managing and using power)
Begins on page 32

Reactive Dyes Today—What They Are, What They'll Do Now, What's Coming
page 74

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page 4

True yarn spinning began with DIEHL* motors

DIEHL'S engineering service is as much a part of their tradition of quality as are the superior power transmitters they design and build to meet your particular needs.

So remember, be it Spinning, Weaving or Roving when you designate DIEHL, 75 years of experience are working for you.

*A Trademark of DIEHL MANUFACTURING COMPANY

Diehl®

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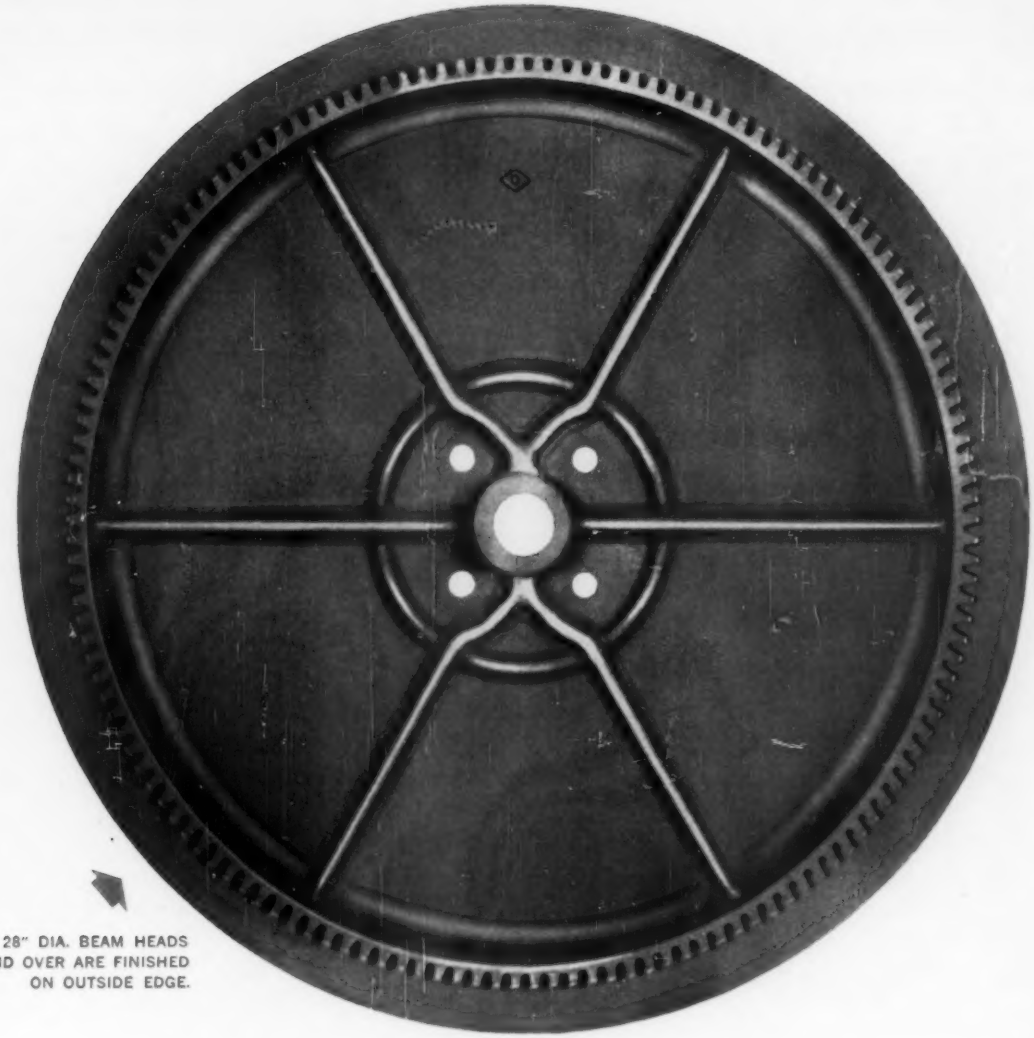
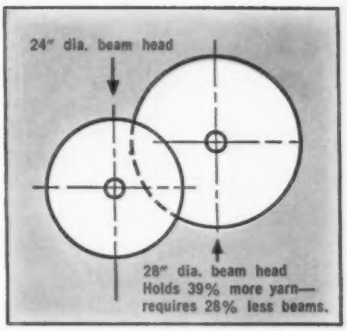


28" DIA. BEAM HEADS AND OVER ARE FINISHED ON OUTSIDE EDGE.

GREATER MILL SAVINGS POSSIBLE WITH LARGER LOOM BEAM HEADS



Insure these savings by specifying Draper Beam Heads. Made from laboratory-controlled materials, with accurate foundry casting and precision machining, top quality Draper Beam Heads protect your changeover investment. Your Draper representative will be glad to investigate the savings you can realize through replacing with larger beam heads.

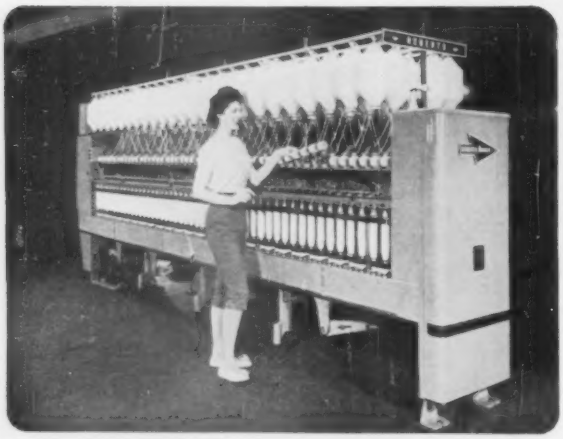
DRAPER CORPORATION

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N.C. • SPARTANBURG, S.C.

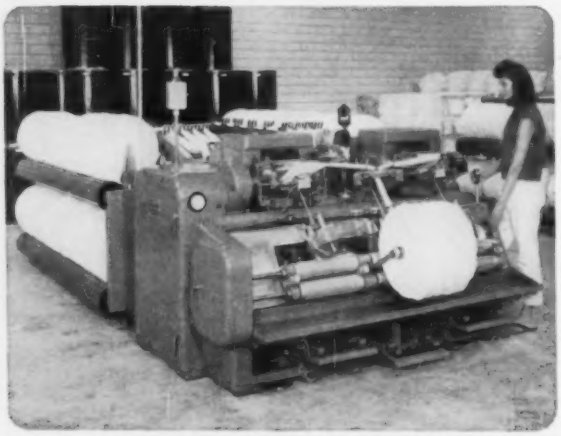
YARN MAKING MACHINERY

ROBERTS NEWS

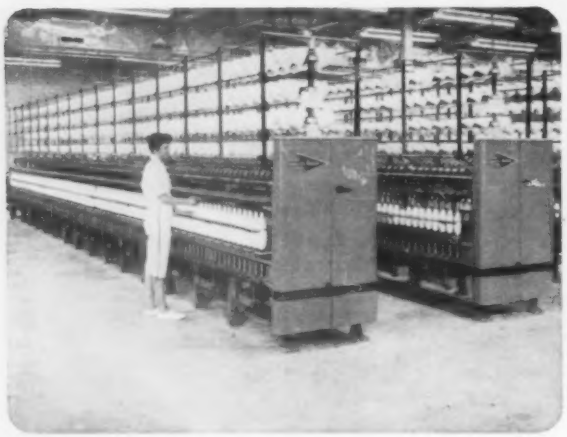
COTTON, WORSTED OR LONG FIBER SYSTEMS



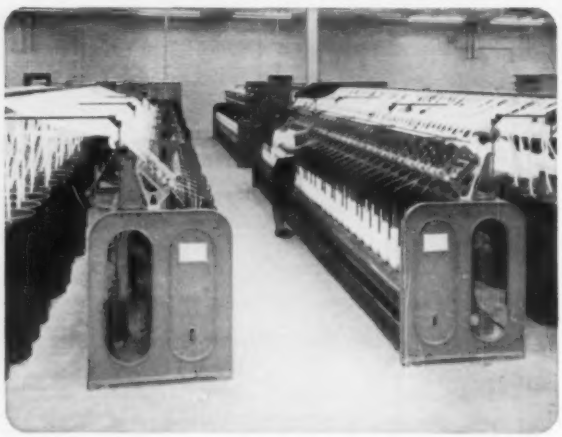
ROBERTS ARROW SPINNING for both cotton system and long fiber system yarn spinning for natural and synthetic fibers and blends. High speed, all ball bearing, big package Arrow Spinning Frames in 25-inch or 36-inch width. Exceptional flexibility and simplicity of operation in the manufacture of improved quality yarns at reduced costs and modest initial investment.



ROBERTS-TEMATEX worsted system preparatory machines, including ParaBlenders, ParaDrafters and AutoEveners, are rugged, high performance machines for pinning, parallelizing, drafting and blending worsted and synthetic fibers prior to roving and spinning, and in top making plants. AutoEvener automatically and instantaneously corrects delivered sliver weight to within plus or minus 1%.



ROBERTS TWISTERS for plying yarns are completely ball bearing equipped and designed for high speed ring twisting operations. 25- or 36-inch frames. Up to 3½-inch rings and 12-inch bobbins. Package weights 1¼ pounds on cotton, ¾ to 1 pound on worsted.



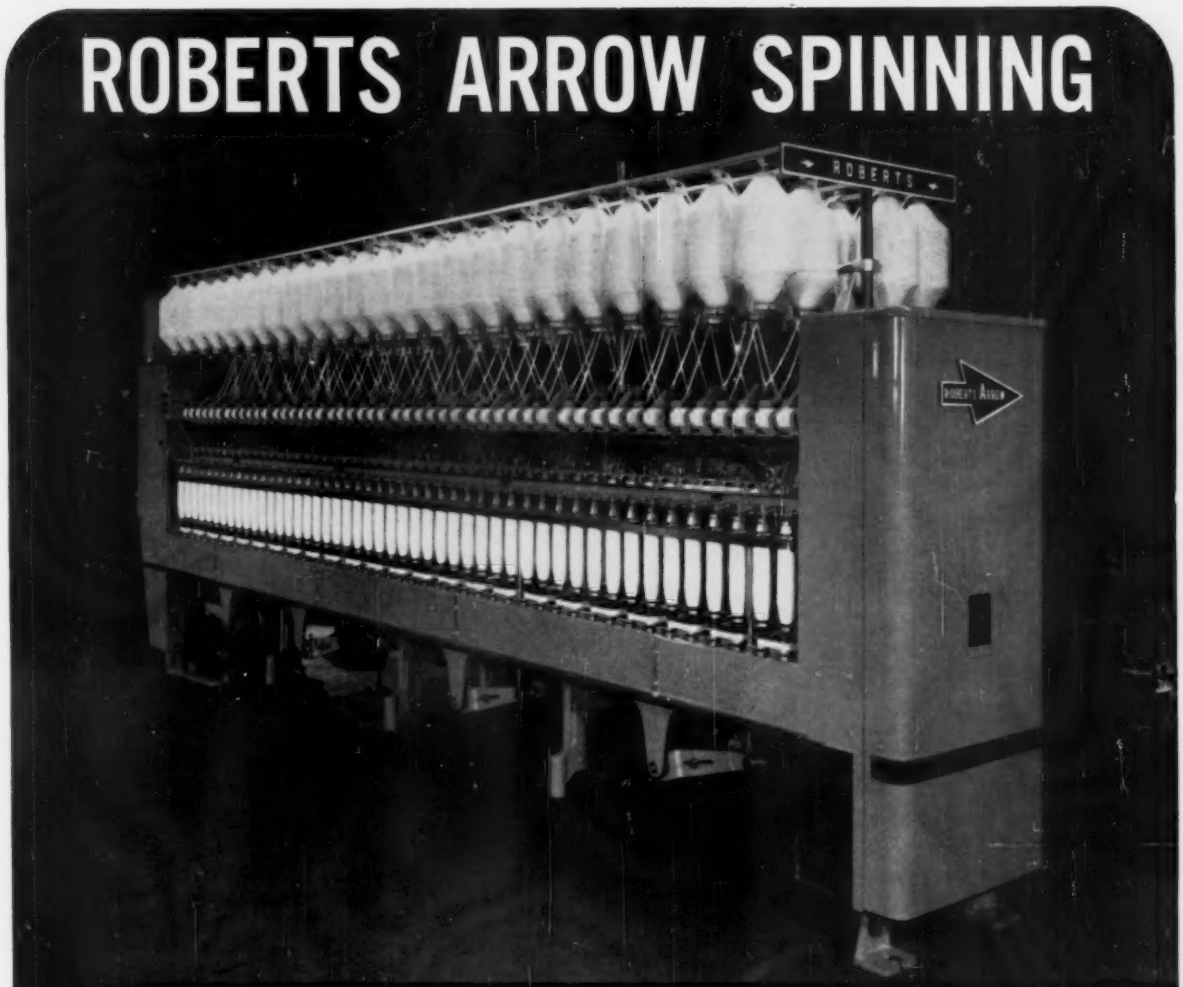
ROBERTS ROVING FRAMES are ball bearing rebuilt and feature all-new heavy duty ball bearing Roberts Double Apron Drafting Systems for cotton, short staple or long fiber synthetics, worsted and blends. 10x5 and 12x7 packages. Provisions for double headed spools.

Simplicity of design, rugged construction and high speed ball bearing operation are the trade marks of all Roberts Company machinery. Roberts also supplies rebuilt spinning frames and modernization changeovers for mills' existing machinery.

ROBERTS COMPANY

SANFORD, NORTH CAROLINA

ROBERTS ARROW SPINNING



Versatility For All Yarn Counts!

Arrow Spinning Frames are available to run all yarn counts from 2's to 120's. More than 1000 Arrow Frames are in service at large and small mill organizations in the U. S. A.

Several examples are provided at the right which demonstrate the versatility of Arrow Spinning.

The newly refined Arrow offers greatest value in high speed operation, bigger packages, dependable performance, low initial cost, and maintenance-free operation. Arrow Spinning is available for both cotton and worsted systems.

Roberts Technical Service backs up every Roberts installation with intelligent understanding of the mill's requirements and ambitions.

THREE MILLS RUNNING ARROW FRAMES ON A WIDE RANGE OF YARN NUMBERS

- An independent producer of Osnaburgs and Corduroys runs 62 Arrow Frames with 20,000 spindles making 3.25's to 8.25's warp spun filling yarn on 3″ rings and 12″ bobbins; 8's to 21's warp yarn on 3″ and 2½″ rings and 12″ bobbins; and 14.5's to 22.5's direct spun filling yarn on 1-9/16″ rings and 8¾″ quills.
- A major mill group uses 50 Arrow Frames with 16,000 spindles to produce 80's to 100's combed long fiber cotton yarn for fine broadcloths on 1¾″ rings and 10″ bobbins.
- A small carded knitting yarn mill uses 20 Arrow Frames with 5040 spindles to run 26's yarn on 2¼″ rings and 11″ bobbins.

ROBERTS COMPANY

SANFORD, NORTH CAROLINA

CIRCLE 3 ON READER SERVICE CARD

TEXTILE WORLD

VOLUME 111, NO. 1 JANUARY, 1961

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Coming Next Month: Report on Research Needs . . . . . and News About Overseas Technology

TEXTILE WORLD has polled 9 outstanding industrial and institutional leaders on the most pressing needs of the industry in terms of research and development. What do we need? How can we get what we need? What will it cost? Where will the money come from? You'll find thoughtful answers to these questions in next month's TEXTILE WORLD as these 9 authorities on textile research tell what they think of the vital job that lies ahead.

Overseas Technology is the name of the new column that will make its appearance for the first time in next month's TEXTILE WORLD. It will appear on an occasional basis whenever the developments overseas (reported by our world-wide corps of correspondents) merit the special treatment you'll be seeing in February's issue.

On Our Cover: Chief Electrician at J. P. Stevens' Dunean man-made-fiber plant checks over one of six huge oil-filled, air-cooled, high-voltage outdoor transformers that help power the plant. Photo by Coxe Studio, Greenville, S. C.

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At new Foster plant of Alice Manufacturing Co., Easley, S. C., Amco systems give just the right temperature, humidity and room cleanliness.

Amco systems control temperature, humidity, room cleanliness at ALICE Manufacturing Company

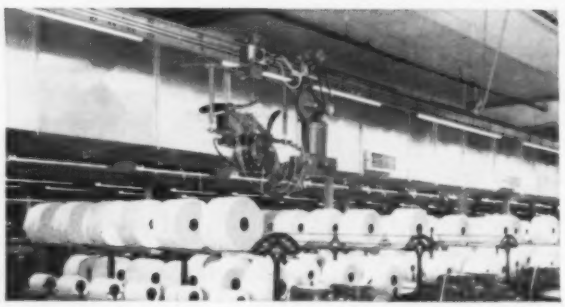
Alice Manufacturing Company is noted for its fine print cloth. One big reason for its success: rigid quality control.

Exact temperature, humidity and room cleanliness control is a must in this manufacturer's quality control set-up. That's why Amco Central Station Air Conditioning, Amco Ceiling Cleaners and Amco Heliclone® Loom Cleaners are on the job!

AMCO AIDS OUTPUT, CUTS WASTE

Here's how Amco-controlled temperature, humidity and room cleanliness help improve quality and boost production. They keep materials in top condition during each processing step to assure stronger, smoother, more uniform fabric. They permit closer machine adjustments, higher machine speeds. They reduce broken fibers, dust, fly . . . greatly decrease the need for cleaning . . . eliminate troublesome static electricity.

You can always rely on Amco to give you dependable advice and expert installation best suited to your needs. Why not learn how Amco can help *your* mill? Contact your nearest Amco representative today.



Combing department at Alice Manufacturing Co. relies on Amco Central Station Air Conditioning and Amco Ceiling Cleaner. Consulting engineers: Campbell and Leppard.

AMCO

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Air Conditioning Equipment — Textile Specialties

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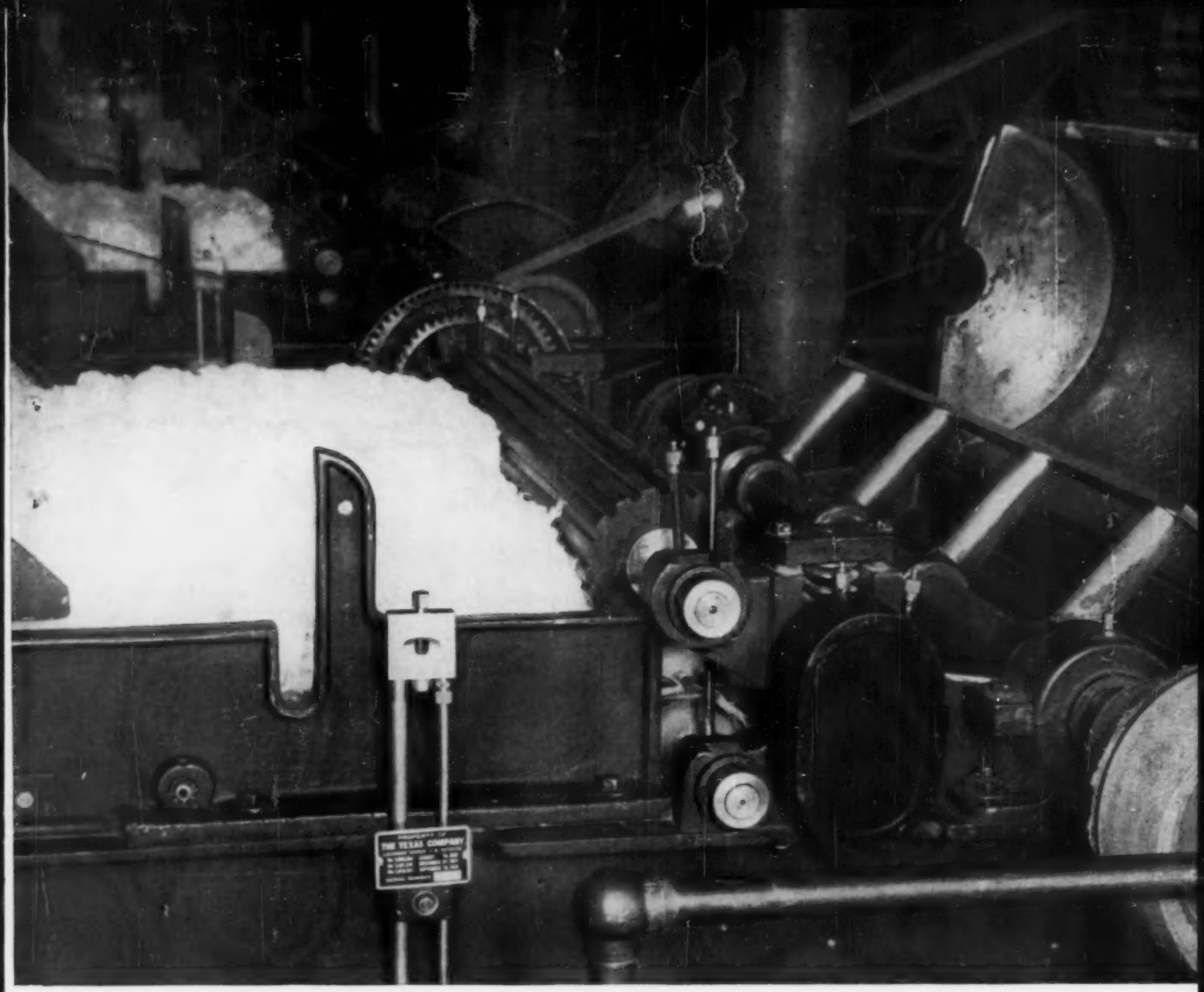

IF YOU WANT TO BE CONVINCED ABOUT THE EFFECTIVENESS OF COTTON CONDITIONING COMPOUNDS...

Here are the proven benefits of Texspray

Yarn is smoother. Texaco Texspray Compound increases fiber flexibility by replacing natural oils; so fibers draft more easily and uniformly, with fewer ends down.

Staple is longer. Texspray conditioning produces a larger percentage of long fibers . . . preserves them against breakage in later manufacture.

Static electricity is sharply reduced. And, in addition, Texspray practically eliminates fly and dust—often by more than 75%!

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ZIPPER TAPES AND OTHER NARROW FABRICS MAY NOW BE DYED IN SKEIN FORM IN THIS NEW MACHINE.

NOTE THESE FEATURES

- Skeins are suspended between stainless steel dyesticks
- Dyeing done in a relaxed condition
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- Air operated front door
- Handles any material—natural or man made
- Steam coil for indirect heating
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- Capacity rated from 100-500 lb.—up to 100% overload under favorable conditions
- Complete line of models from 10-50 sticks

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TEXTILE WORLD . . . Calendar

January

AATCC, Piedmont Section, Poinsett Hotel, Greenville, S. C., Jan. 21

National Cotton Council, annual meeting, Hotel Peabody, Memphis, Tenn., Jan. 30 & 31

February

Canadian Textile Conference, Queen Elizabeth Hotel, Montreal, Canada, Feb. 7 to 9

AATT, annual meeting, Hotel Commodore, New York, N. Y., Feb. 8

March

AATT, monthly meeting, Della Robbia Room, Hotel Manger-Vanderbilt, New York, N. Y., March 1

National Association of Secondary Material Industries, Inc., annual convention, Fairmont and Mark Hopkins Hotels, San Francisco, Calif., March 11 to 15

ASME, Textile Engineering Conference, Clemson College, Clemson, S. C., March 16 & 17

American Cotton Manufacturers Institute, annual meeting, Fontainebleau Hotel, Miami Beach, Fla., March 23 to 25

April

Alabama Textile Manufacturers Association, 60th-Anniversary Convention, Buena Vista Hotel, Biloxi, Miss., April 12 to 14

Narrow Fabrics Institute, Inc., spring meeting, The Tides Inn, Irvington, Va., April 16 to 18

Georgia Textile Operating Executives, spring meeting, Hightower Building, Georgia Institute of Technology, Atlanta, Ga., April 23

Underwear Institute, annual meeting, Hotel Dennis, Atlantic City, N. J., April 24 & 25

45th Knitting Arts Exhibition, Civic Auditorium, Atlantic City, N. J., April 24 to 28

Georgia Textile Manufacturers Associations, Inc., annual meeting, Hollywood Beach Hotel, Hollywood, Fla., April 26 to 29

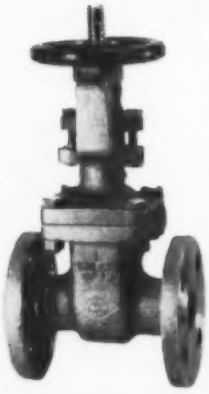
May

Alabama Textile Operating Executives, spring meeting, Thach Auditorium, Auburn, Ala., May 6

For 99 out of 100. . .

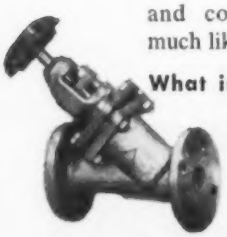
Selection of Stainless Steel Valves can be as simple as selection of Bronze and Iron valves

HOW to keep it simple? Don't let the wide selection of stainless steel alloys "throw you"!

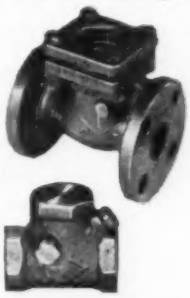


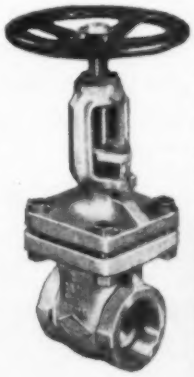
Most of the alloy specs were developed to meet certain highly specialized and rather uncommon needs. Only 1 out of 100 valve users can make practical use of many of the alloys. *Actually, just two or three of the different available alloys will give a big majority of valve users all they want and need.*

You can judge DESIGN differences between the various "makes" exactly as you do it with Bronze and Iron valves. Look them over and compare. Basically, of course, a Stainless Steel valve is designed and constructed very much like other valves.

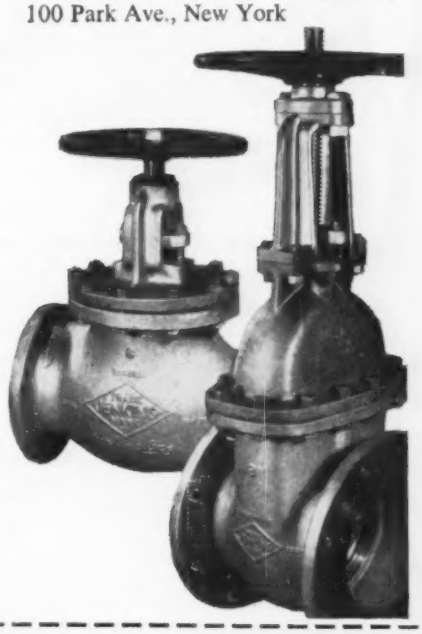


What is left to worry about in addition to Material and Design? The same factors you consider in buying ANY valves for long, dependable performance: Are the valves made merely good enough, or to a standard that demands an extra-measure of quality? How good are the castings? How precise and perfect is the machining? How rigid is the inspection and testing during manufacture? These are the factors which specs can't cover. Some of them you can't see when you look at the valve. But you KNOW how to make sure they measure-up to peak standards. You know that the name JENKINS VALVES and the famous Jenkins DIAMOND trademark have been the highest assurance of quality for nearly a century.





Specify *"Jenkins"* as well as the metal alloy to assure fullest satisfaction. Your Jenkins Distributor has patterns and alloys to satisfy most industrial needs. Of course, they meet valve industry specifications and the high standards established by leading users of stainless steel valves. Jenkins Bros., 100 Park Ave., New York



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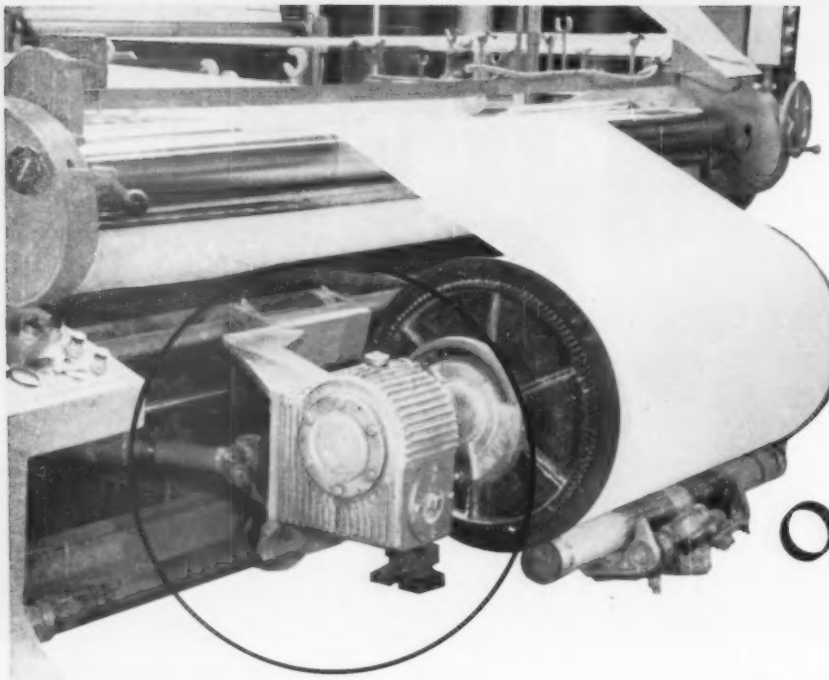
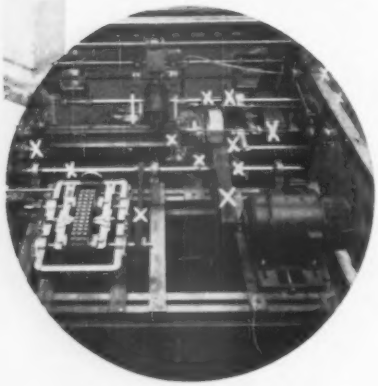


Don't Be Chained to Outmoded Drives



X These parts are eliminated

In this slasher drive a few simple and rugged parts replace the complicated maze of belts, chains, sprockets, etc. presently used in other slasher head drives. It has no sliding sprockets or gears. This eliminates the constant adjustments and the replacement of expensive parts which were formerly accepted as necessary. The result is long, trouble-free, and extremely quiet operation with greatly reduced downtime and consequent higher production.

The telescoping feature of this Torque Tube Drive permits the running of greatly varying width beams without projecting spindles. In addition, only Cocker's new HD Cylinder Section construction permits removal of bottom cylinders without removing top cylinder.

The Cocker Torque Tube Drive is standard equipment on all Cocker Slashers, whose other features remain as before — rugged construction, complete and accurate push button controls, full instrumentation, new fast and simple beam doffing, and Cocker's patented Type B Beam Drive which provides constant adjustable tension regardless of speed or load. Speeds up to 184 ypm and 20% to 25% more yarn per loom beam with production rates of over 1,650 lbs. per hour. Write for full information today.

*Pat. Applied For

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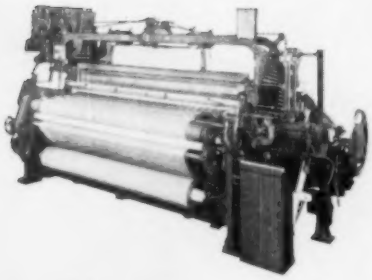
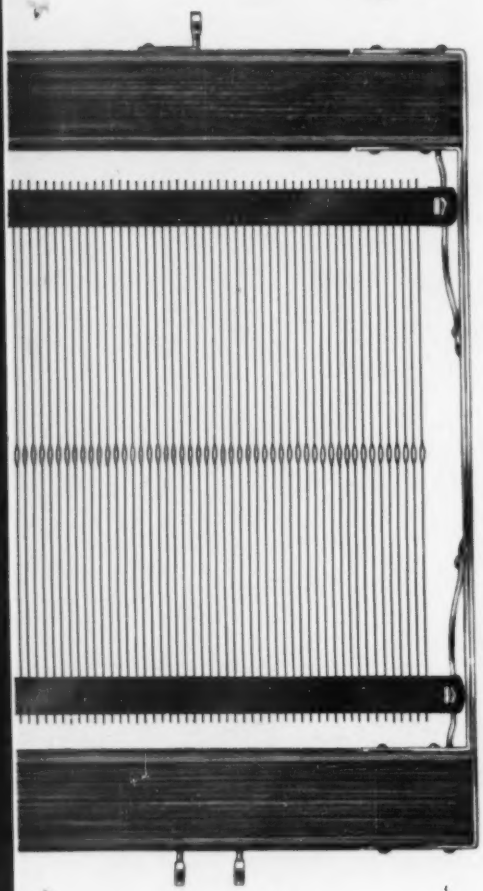




Stehedco

STEHEDCO Flat Steel Heddles and STEHEDCO Harness Frames have been unequaled for dependable Quality and Economy of operation from the time that Flat Steel Heddles were first introduced in this country by Steel Heddle Mfg. Co. in 1897.

All STEHEDCO Products are manufactured of Premium Quality materials under strict Quality Control, with the fine skill and experience of Master Craftsmen.

Numerous textile mills are completely equipped with STEHEDCO Frames and Heddles because they have proved through the years that they consistently give longer trouble-free service, and produce finer quality fabrics with economy you can bank on.

There are STEHEDCO Heddles and Frames for weaving every type of fabric, from the finest fabric to the heaviest carpet. Why don't you ask one of our qualified Sales Engineers to show how YOU CAN PROFIT MORE by using STEHEDCO Heddles and Frames. It's GOOD BUSINESS.

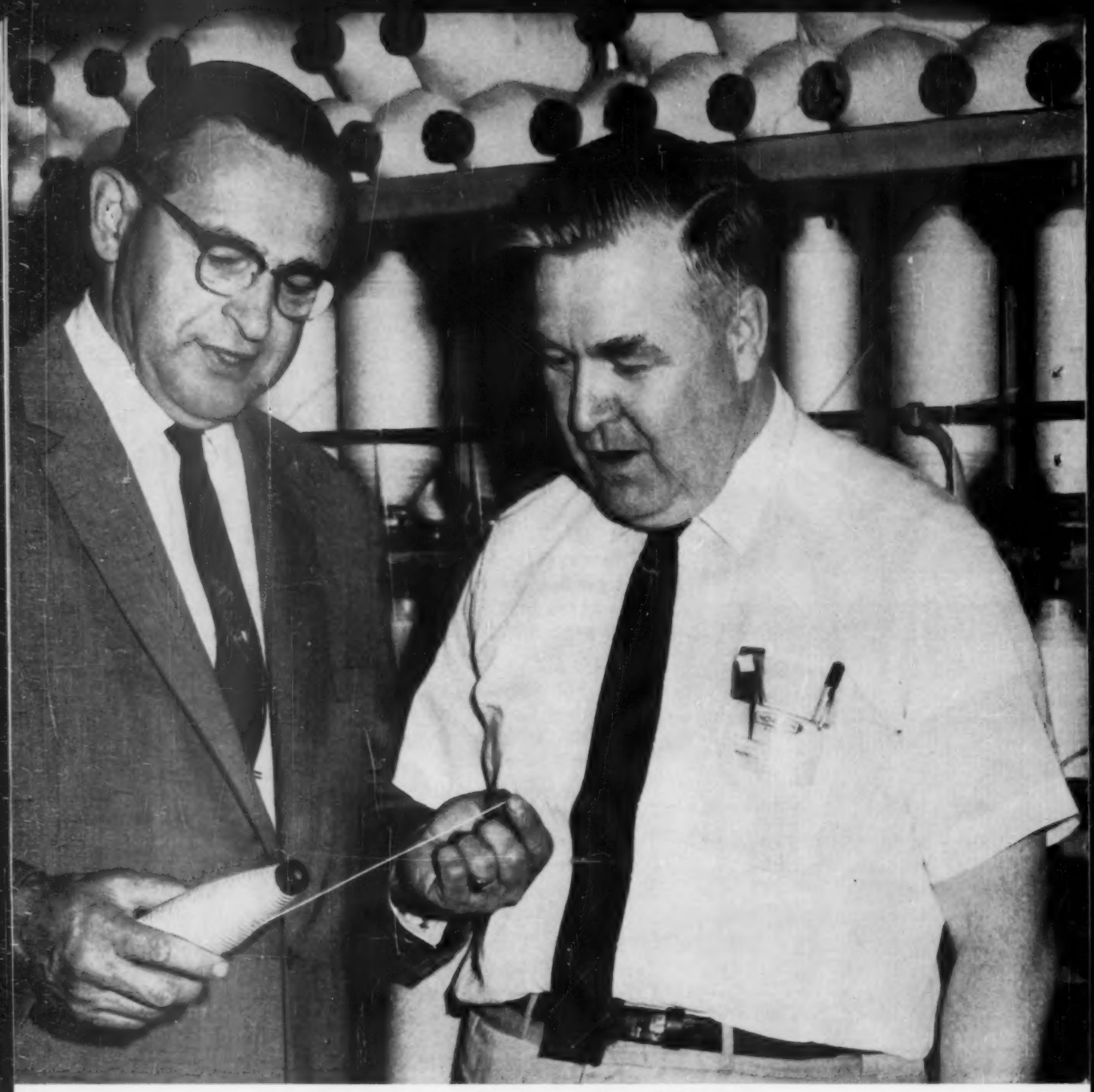
Stehedco
STEEL HEDDLE MFG. CO.
PHILADELPHIA 32, PA.
SOUTHERN SHUTTLE DIV.
GREENVILLE, S.C.
Southern

F-6013

Illustration of C. & K. W-3 Loom courtesy of Crompton & Knowles Corporation

Other Plants and Offices: Granby, Quebec, Canada • Lawrence, Mass. • Greensboro, N.C. • Atlanta, Ga. • Textile Supply Co., Dallas, Texas • Albert R. Breen, Chicago, Ill.

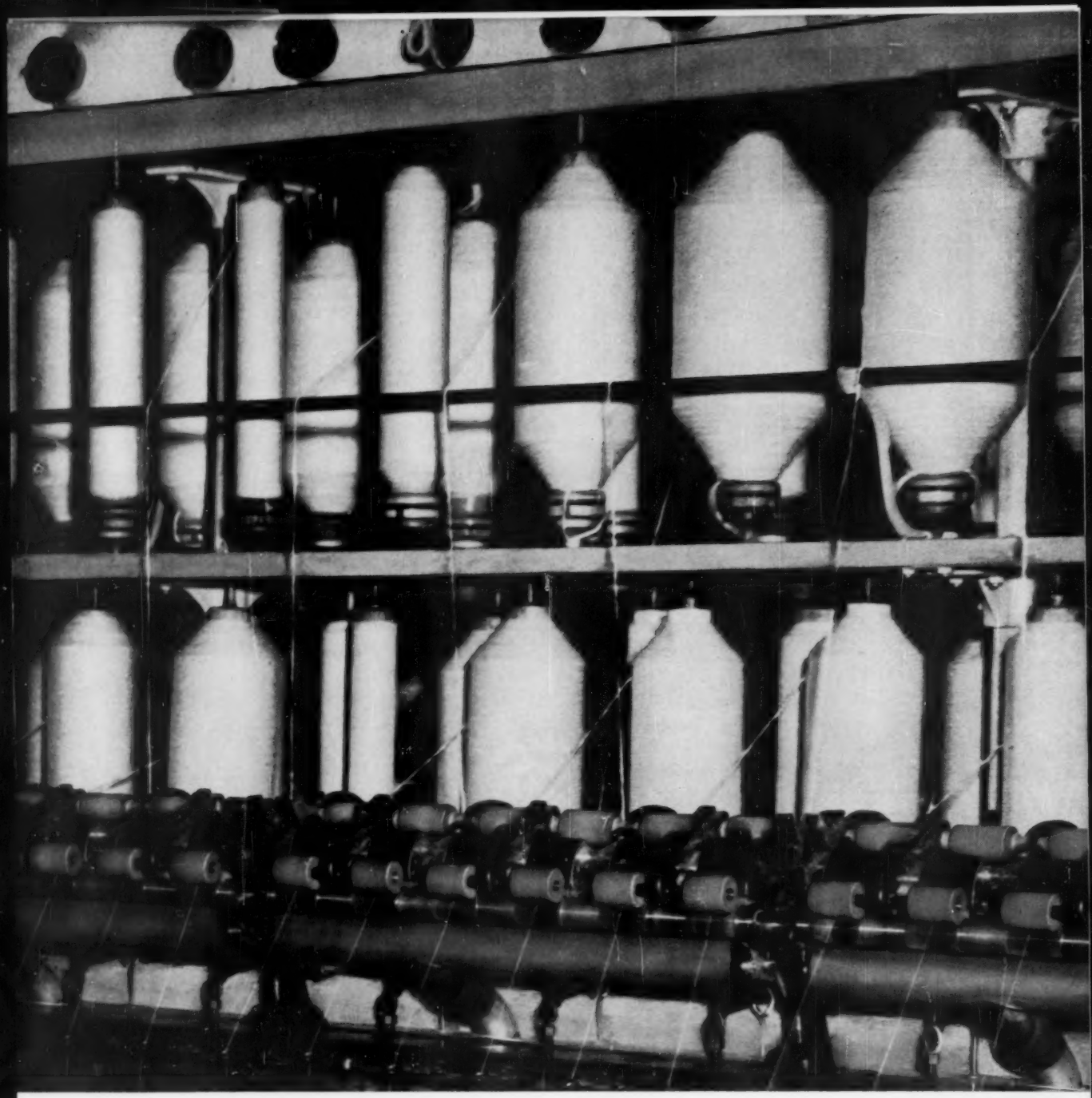
CIRCLE 11 ON READER SERVICE CARD



Mr. Martin O'Neil, Overseer of Spinning at Chicopee Manufacturing Corporation, Manchester, N. H., checks yarn quality with Armstrong representative D. T. Starkey.

Get maximum production of high-quality yarn

If front roll lap-ups, eyebrowing, or yarn irregularities are slowing down production for you, a switch to Armstrong Accotex Cots may help bring your production up to maximum level. • The special rubber compounds that go into Accotex Cots are engineered to overcome these common spinning problems. For example, new anti-static compounds eliminate the major cause of front-roll lapping and have solved the problem for many mills. • Another anti-static material, Accotex NC-762, has effectively reduced eyebrowing in mills that use flat clearers—and provided a substantial reduction in total waste as well. • Armstrong has

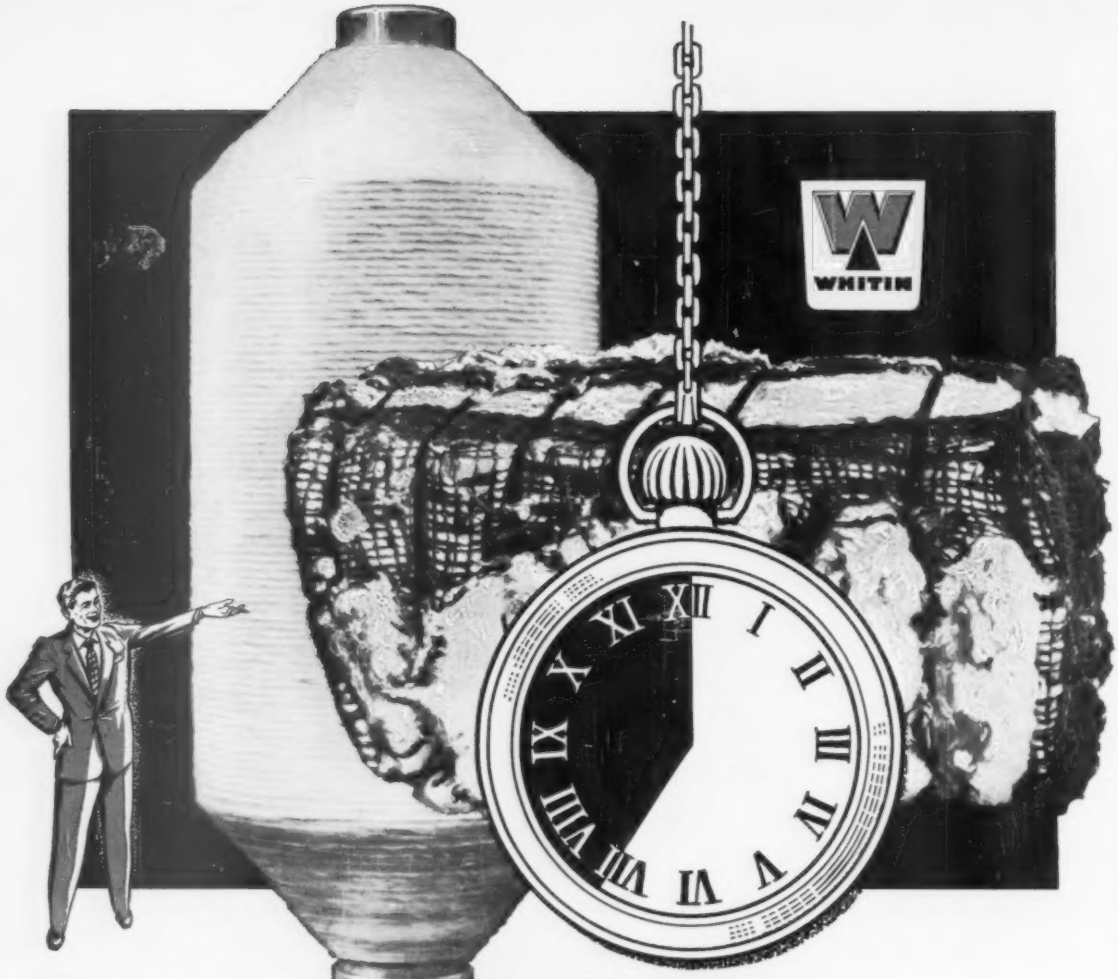


. . . for years . . . with Armstrong Accotex Cots

also developed new compounds which give excellent service on drafting systems where a softer cot reduces yarn irregularities and improves break strength. • Your Armstrong man will be glad to discuss your spinning problems with you and recommend an Accotex Cot that fits your needs. Call him or write for more information to Armstrong Cork Company, Industrial Division, 6501 Dauphin Street, Lancaster, Pennsylvania.

Armstrong ACCOTEX COTS

CIRCLE 13 ON READER SERVICE CARD



Process over a BALE at a time ...in 3/5ths of the time

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MODEL P Roving Frame

Don't wait! For complete information call your Whitin Representative or write direct to us for descriptive brochure

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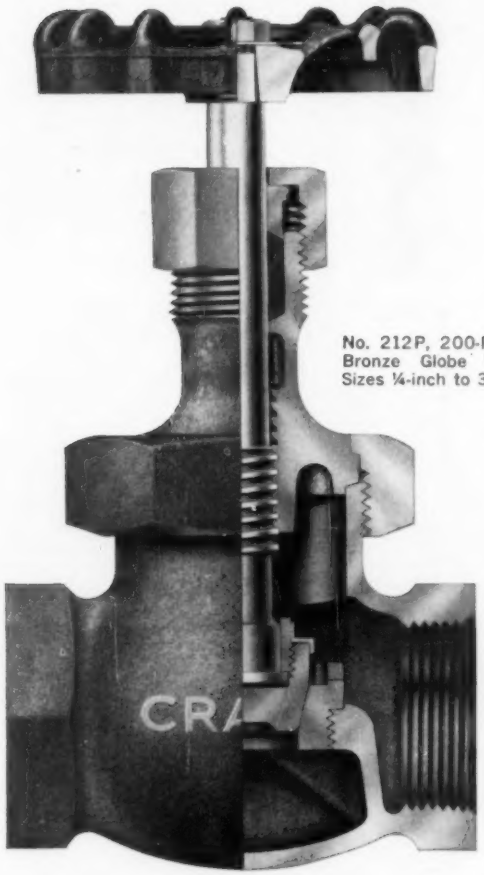
CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

Best choice for throttling service...

CRANE PLUG DISC BRONZE GLOBES



No. 212P, 200-Pound Bronze Globe Valve. Sizes ¼-inch to 3-inch.

These rugged valves are made for the toughest throttling jobs! Use them anywhere . . . on blow-off, boiler feed, soot blower, and drip and drain lines . . . then sit back and forget your maintenance worries.

Crane's "500 Brinell" stainless steel disc and seat give superior protection against corrosion and wear. The wide seating surface resists wiredrawing and damage from foreign matter. Deep stuffing box is filled with high grade packing.

Crane Plug Disc Bronze Globe Valves are made in 150-Pound, 200-Pound, and 300-Pound pressure classes, in a full range of sizes. Your Crane Distributor can ship your requirements from stock.

Crane Plug Disc Bronze Valves are also available in angle pattern

New! Write for your personal copy of Crane's Catalog 60. In it you'll find complete specifications on Crane's full line of bronze valves, and valves for every fluid handling service.

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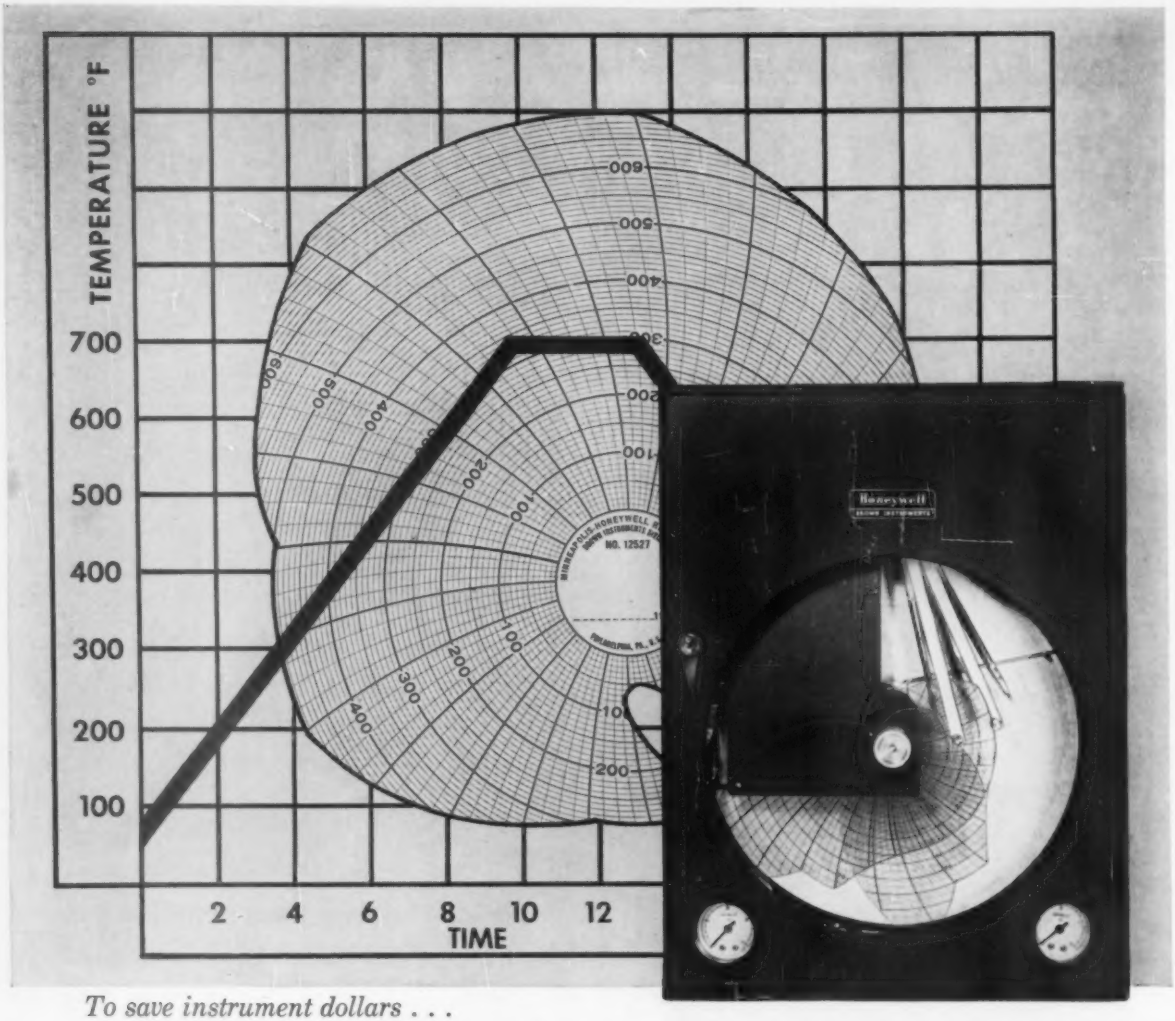

To save instrument dollars . . .

PROGRAM-CONTROL TWO PROCESSES WITH ONE THERMOMETER-CONTROLLER

Use dual-cam dual-control thermometers in size cooking, piece goods dyeing—in *any* process that requires precise time-temperature control for batch-to-batch uniformity.

This versatile Honeywell cam program thermometer is the equivalent of two separate program control thermometers in a single instrument case, and can carry out two related or even two entirely unrelated process programs at once.

The instrument has two thermal systems, two pens, two control units, two cams and two cam drive motors. Process patterns are cut into the cams to the pattern desired in the controlled variables. Every time a particular cam is used, the same program is repeated *identically* time after time, without attention from the operator.

The set point indexes automatically change position in response to turning of the cams. Behind the cams—transparent so you can see the chart through them—pens draw records of the measured values of the variables. Automatic control units signal final control elements to vary flow of control agents in accordance with program requirements.

Automatic programming gives you consistent quality, reduces the need for operator attention and increases productivity. Your nearby Honeywell field engineer can help you work out the most efficient and economical approach to program control. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa.—In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

Honeywell

First in Control

SINCE 1885

Index of Textile-Manufacturing Activity
(Man-hours worked, adjusted for changes in productivity. 1954=100)
1957
Jan. 108
Feb. 108
Mar. 107
Apr. 107
May 106
June 107
December Estimate 111
Source: McGraw-Hill Economics Department.
J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1957
1958
1959
1960

In 1961: A 1% Gain

Textile mills ran at a fast clip during the first half of 1960, a bit slower in the second half. Nevertheless, the industry's momentum promises to carry over into this year. Production by textile mills this year should score a modest gain—about 1%—over 1960's output. In terms of TEXTILE WORLD's Index of Textile-Manufacturing Activity, this year's average should run about 116, compared with 115 for 1960.

•

Gross National Product—the nation's overall measure of business activity—as well as disposable personal income will move sideways during the next few months, but both will show a rise during the second half of 1961. With population rising 1½% this year, and consumer outlays for soft goods up even more, apparel sales are sure to rise apace. And the outlook for sales of home furnishings this year is also bright. Mortgage money for new home construction is now plentiful, and housing starts should begin to reflect this fact very soon. For 1961 as a whole, housing starts will be nearly 100,000 units higher than last year. Along with these gains will go gains in sales of home furnishings.

•

Unfortunately, the auto industry—the largest industrial consumer of textiles—is a cloudy spot on the economic horizon this year. Production of new cars will probably fall off substantially in 1961, so textile consumption by auto makers will also fall.

Figures of the Month

TEXTILE-INDUSTRY INDICATORS

	Latest Month	Previous Month	Year Ago
Textile World's Exclusive Index (chart above)	111	112	118
Employment (thousands)[1]	925.8	932.8	969.3
Production Workers (thousands)[1]	831.7	839.3	875.6
Weekly Earnings[1]	62.69	62.86	64.40
Hourly Earnings[1]	1.62	1.62	1.59
Weekly Hours Worked[1]	38.7	38.8	40.5
Production Index (1957=100)[2]†	103*	104	111
Wholesale Price Index (1947-49=100)[1]	95.5	95.8	96.3
Manufacturers' Sales (million $)[3]	1140*	1200	1197
Manufacturers' Inventories (million $)[3]	2690*	2640	2536
Inventories-to-Sales Ratio	2.36*	2.20	2.12
Exports (million $)[3]	122.3*	79.7	108.1
Imports (million $)[3]	92.4*	100.9	99.7
Stock Price Index (1941-43=10)[4]	24.97	25.35	32.16
Failures (number)[5]	8	4	12

NATIONAL ECONOMIC INDICATORS

Industrial Production (1947-49=100)[2]	159	162	156
Consumer Price Index (1947-49=100)[1]	127.4	127.3	125.6
Wholesale Price Index (1947-49=100)[1]	119.6	119.6	118.9
Civilian Population (millions)[6]	181.7	181.4	176.3
Unemployment (millions)[2]	4.0	3.6	3.7
Employment (millions)[2]	67.2	67.5	65.6
Personal Income (billion $)[3]	409.5	409.5	388.7

* October; otherwise latest month is November.

1. Bureau of Labor Statistics; 2. Federal Reserve Board; 3. Department of Commerce; 4. Standard & Poors; 5. Dun & Bradstreet; 6. Bureau of the Census; † Annual rate.

NEWS and COMMENT. . . . . .

MEN WHO LOOK FOR SIGNS OF WHAT'S AHEAD IN TEXTILE BUSINESS CAN ROUND UP A WIDE RANGE OF INDICATORS AND OPINION. TAKE A SAMPLING:

West Point Mfg. Co.--For the three months ended November 26 President J. L. Lanier reports a decline in sales ($35,515,000 in 1960 vs. $37,722,000 a year earlier) and in earnings ($1,652,000 vs. $1,916,000). Unfilled orders have declined 6% since the start of the quarter just ended and are now 28% less than a year ago. Shipments for the first half of the current fiscal year (September-February) will be down about 10% from a year ago.

Textiles-Incorporated--For the year ended October 1 the company reports net sales of $28,616,044 (vs. $28,571,141 a year earlier) and net earnings of $1,427,071 (vs. $1,156,693). Chairman J. C. Roberts points out that the company in 1960 spent $1,300,000 for new machinery and other plant improvements--and that it must keep on spending for improvements to produce a quality product at a cost competitive with the rest of the industry.

Munsingwear, Inc.--President George McConnell expects his company to wind up 1960 with net about equal to last year's $1,608,092 and with sales slightly higher than last year's $43,794,168. He sees production in the first quarter of 1961 continuing at the level of the fourth quarter of 1961.

Berkshire Hathaway, Inc.--President Seabury Stanton foresees a slowdown in the first half of 1961, but not as deep a dip as in 1957-58. Pent-up demand for textile products will be felt in the next six months or so.

James Lees & Sons Co.--Chairman J. L. Eastwick sees the possibility of a 35% increase for the carpet industry by 1965. He warns against judging future growth of the carpet industry by the current "adjustment period."

J. P. Stevens & Co., Inc.--For the fiscal year ended October 29 net sales totaled $512,655,286 (vs. $459,428,608 a year earlier) and net income came to $15,302,533 (vs. $18,709,382). Provision for federal and state income taxes in 1960 came to $17,765,000 (vs. $7,100,000 in 1959).

Credit Clearing House Div., Dun & Bradstreet, Inc.--In November failures among manufacturers of textile-mill products totaled 8 in number and $1,326,000 in liabilities (vs. 12 and $782,000 in November 1959). For the first 11 months of 1960 failures totaled 63 and liabilities $6,329,000 (vs. 61 and $6,326,000 in the same period a year earlier).

FLURRIES OF ACTIVITY, TOGETHER WITH ANNOUNCEMENTS FROM ONE QUARTER AND ANOTHER, KEPT THE TEXTILE-IMPORTS ISSUE IN THE NEWS.

President-elect Kennedy's appointment of North Carolina's Governor Luther H. Hodges as Secretary of Commerce met with something less than enthusiasm in some quarters of the industry. Gov. Hodges, a textile man himself, as recently as late in December refused to take any specific position on the question of textile imports. "I know something about the textile problem," he said, "but it is not as simple as they make it sound." From this and other statements observers conclude that the new Commerce secretary will aim primarily at increasing international trade, especially at increasing exports of a wide variety of manufactured products from the United States.

Japanese exports of cotton fabrics to the United States will be substantially below the year's quota in 1960, says the Association of Japanese Textile Imports, Inc. Why? Because for a while Japanese feared an

8¢-per-pound duty would be imposed, because prices for Japanese goods have been rising while prices for American goods have been falling, because competition is growing from Spain and Portugal, and because there have been problems in allocating quotas to individual Japanese manufacturers.

Nearly 95% of the cotton yarn exported by Japan in September went to Asian countries, says the Japan-U. S. Textile Information Service. Only 0.00026% of the yarn exported by Japan in September came to the United States, though over half of the raw cotton used in Japanese mills in that month was of United States origin, the agency says.

Legislation to control yarn and other textile imports is being urged by the Carded Yarn Association. The association has joined other textile and related groups in asking the government to place yarn imports specifically and textile imports in general under effective control.

Textile business in Europe is far better than in the United States, says James Stuart, Southern Machinery Co. president. He returned recently from a trip to Europe in November. "The textile mills I saw there are going full blast, "he reports.

BRIEFS FROM OVERSEAS--Tel Aviv (TEXTILE WORLD's Sig Goldstein): ATA Textile Co. will spend $1.8-million to add 14,000 spindles and 100 looms and $1.7-million for modernization and new buildings. Aim: finer-count yarns, higher-quality fabrics, more exports. . . Bombay (TW's Sharokh Sabavala): Indian textile manufacturers are complaining about the quality of United States cotton now arriving and are fearful of continuing poor quality in the large imports they expect over the next three or four years. They claim only 40% of the cotton is up to standards. . . Lisbon (TW's Jim Morrison): Know-how for expansion of capacity and complete modernization of the mill of Fabrica de Texeis Artificiais de Amora will be provided by Hillyer Associates, a United States firm. Modernization extends to production, quality, fiber utilization, printing, finishing, and design. . . Vienna (TW's F. H. Baer): News from this listening post close to the Iron Curtain is that Russia expects a cotton harvest of 6-million metric tons (about 26.4-million 500-lb. bales) in 1965. Mechanization of cultivation and harvesting will make the goal possible, officials say. . . Amsterdam (TW's Paul Catz): Royal Nijverdal-Ten Cate, a leading textile mill in the eastern Netherlands, has established a joint venture in Holland with J. P. Stevens & Co. The new enterprise is capitalized at 500,000 guilders ($131,500). It will make and sell work clothing, jeans, and rainwear. Stevens officials say the venture is based on the need to participate in manufacturing and distribution close to textile consumers in the protected European markets.

BRIEFS AT HOME--Sea Island: The tax committee of the American Cotton Manufacturers Institute agrees on the urgent need for faster depreciation of textile machinery but gets little encouragement to hope for legislative relief from Leo Irwin, chief counsel of the U. S. House of Representatives Ways and Means Committee. . . Charlotte: ACMI has launched a test run of a new educational and promotion program involving a kit (called "The Textile Traveler") that contains the story of the industry and some demonstration materials. . . Albany, Calif.: Recent research on wool finishing and on civilian and military preferences in finishes will be major subjects at a U. S. Department of Agriculture-sponsored conference in Albany, February 9-10.

WASHINGTON OUTLOOK . . . . .

Incoming Secretary of Commerce Luther H. Hodges is representative of the "balanced liberal" label that Washington observers already are attaching to President-elect Kennedy's cabinet, policies, and philosophy of government. As he is textile man, Hodges' appointment has a special significance to domestic mills.

Hodges' background as a Marshall Field & Co. vice-president (handling textile production) and as governor of cotton-growing, textile-producing North Carolina has helped shape his firm belief in private enterprise as the key to U.S. economic growth and strength.

At the same time, Hodges has little use for trade protection. Swamped with questions on how he rationalizes his textile background with an avowed freer trade philosophy, Hodges unhesitatingly puts it this way:

"The domestic textile industry's economic problems cannot all (or even primarily) be laid to import competition," he told TEXTILE WORLD last month. As Secretary of Commerce he sees a job to do in "strengthening and making all U.S. business, including textiles, more competitive. But," he adds, "that cannot be done by shutting out foreign competition."

*

What Hodges--and Kennedy--have in mind is a broad, ambitious program of gearing foreign and domestic economic policies together in such a way that U.S. productivity is spurred at home, competitiveness pushed overseas.

Reduced to simplest terms, this means subsidies to domestic producers, possibly including textile mills, and a much heavier emphasis on exports.

Hodges is expected to play a key role in formulating Kennedy's export promotion policies. Both men are on record as regarding potential U.S. export markets as one of the best answers to the balance-of-payments problem. Both men also believe that the recent encouraging pick-up in textile exports is a good omen.

Broader export credit insurance is one of the first major programs the new administration can be counted upon to follow up. Another is a basic rewriting of the existing trade laws, including so-called trade adjustment provisions that would subsidize domestic producers who can prove they have been hurt by foreign competition.

Kennedy will move slowly in vacating any of the recent Eisenhower edicts that aimed at reducing United States dollar spending overseas. "Tied" foreign economic aid loans will reduce the amount of textiles and other products bought from foreign suppliers, though not the amount of aid to under-developed nations, including textile-producing nations.

*

The Kennedy-Hodges approach to domestic and foreign economic problems and solutions will run up against an increasing wave of trade protectionist sentiment in the new 87th Congress.

Already proponents of higher legislative or administrative barriers against foreign competition are marshaling forces to fight the new administration's freer-trade line.

*

A Capitol Hill fight is probably on the way on the highly legalistic question of whether the President has the authority to modify tariff commission recommendations in escape-clause cases. Government lawyers argue that the 1958 Trade Agreement Act Extension gives more precise recognition to the President's right to rewrite Tariff Commission findings.

all about DRYING
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(audio) . . . with infra-red
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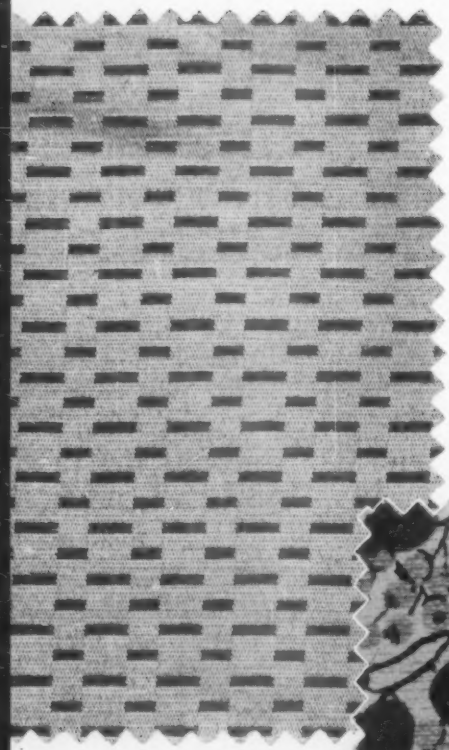
Variety's
your challenge.....



Tomorrow's markets will belong to the mills that have prepared for them today. UNIFIL® Loom Winders are giving modern mills a market-oriented advantage.

UNIFIL Loom Winders enable weave rooms to use a wide variety of filling yarns; natural and man-made; spun, filament and textured. The single shuttle weave room can switch filling yarns from one count to another, from one fabric to another as quickly as fashion trends change — *and at no extra cost.*

While insuring against market demand variances, UNIFIL Loom Winders drastically reduce inventory and production planning, work scheduling and employee training. These savings and the inherent operating economies of UNIFIL are the major factors in purchasing decisions.

UNIFIL's unmatched versatility meets today's needs and tomorrow's markets. It allows mills to wind from any filling supply *economically.* Quills are wound and shuttles loaded, empty quills stripped and returned for rewinding — *all automatically at the loom!*

Investigate UNIFIL for greater versatility and economy. Learn the reasons why leading textile mills consistently reorder UNIFIL Loom Winders. Call your nearest Leesona Sales Engineer — in Boston, Philadelphia, Charlotte, Atlanta or Los Angeles. Or write LEESONA CORPORATION, P. O. Box 1605, Providence 1, Rhode Island. Keep pace with your market with UNIFIL.

..... meet it with *Versatility!*

Some of the many modern mills that are meeting today's challenges with **UNIFIL** *Loom Winders*

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TALLASSEE MILLS
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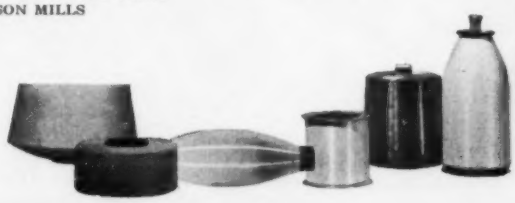
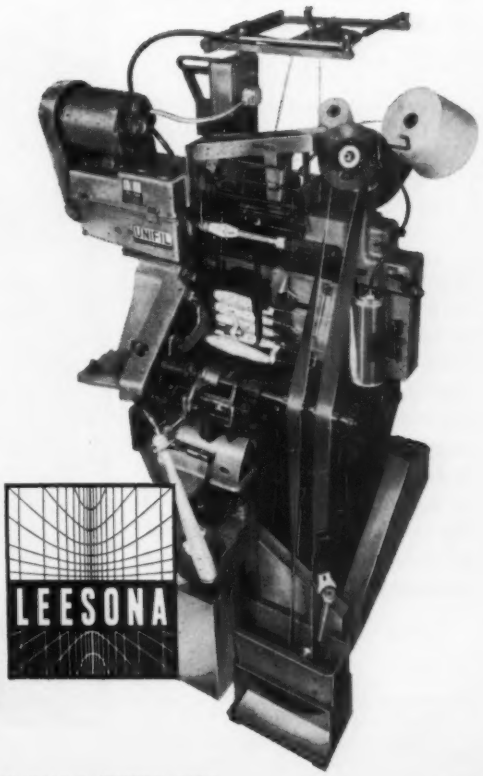
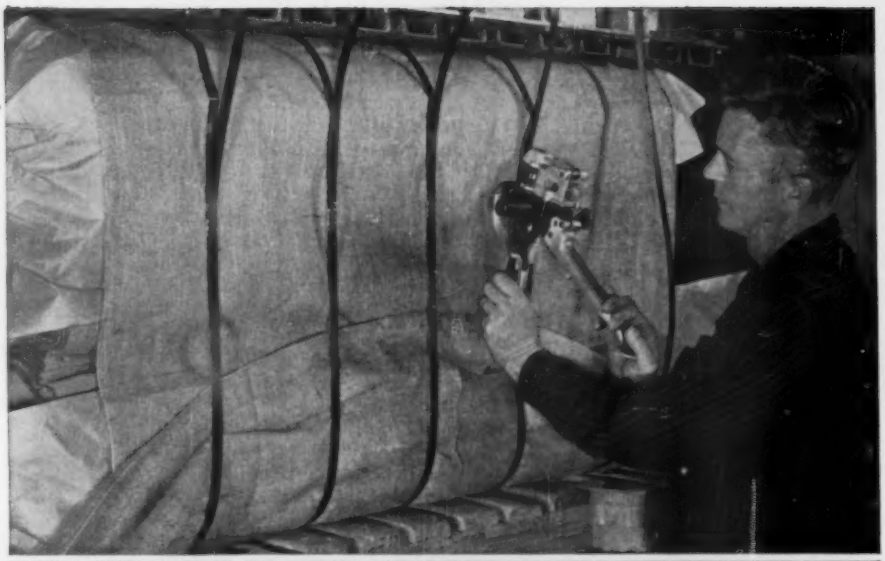
WOODSIDE MILLS



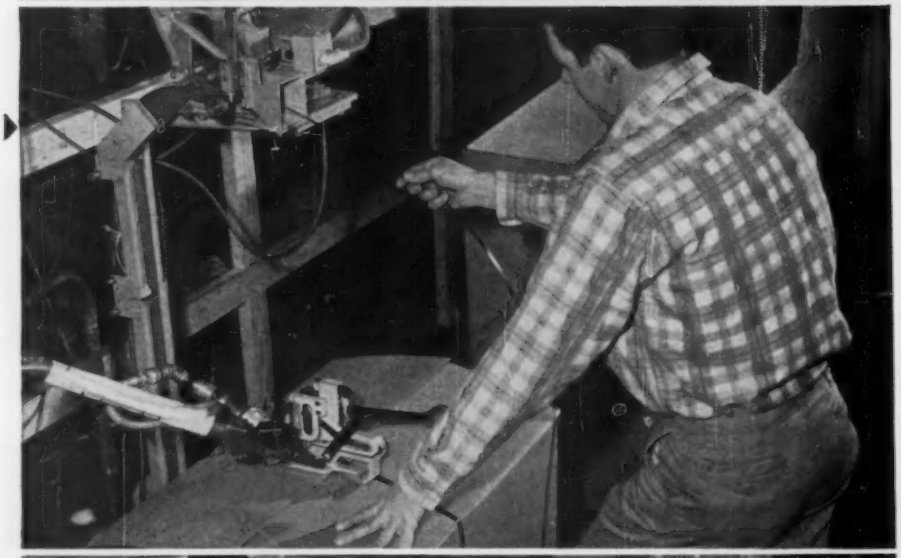


CIRCLE 23 ON READER SERVICE CARD

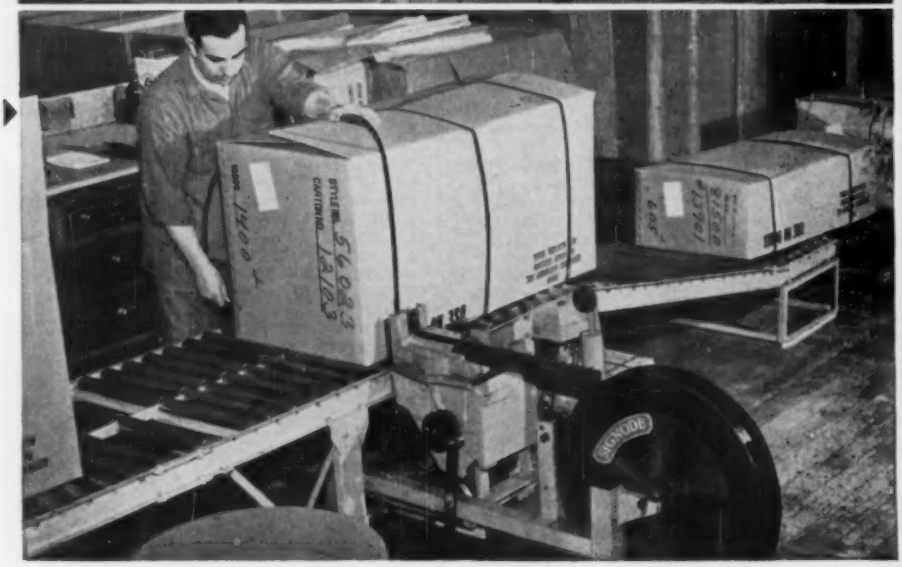
Signode Model SFC manually-operated seal feed strapping tool tensions, seals and scores strap at the seal for easy break-off with fast, smooth, one-arm movement. Weighs only 6½ lbs., and its almost perfect balance makes it easy to handle with one hand. In the illustration, the operator is using the SFC in the Signode strap-saver baling method, which reduces strap use by as much as 17%.

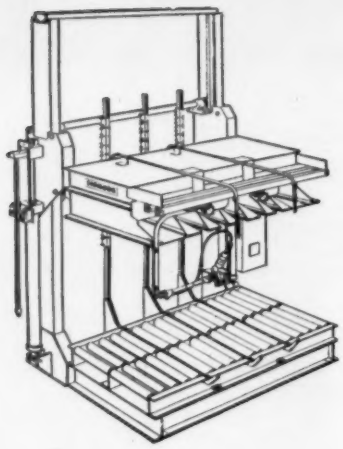


Signode Power Strap Feeder is a motorized, foot-pedal operated device for putting strap around big packages. It eliminates the need for a helper, enables one man to strap as many as 500 large cartons per day. Can be used with the Model AP strapping tool shown, or any of Signode's hand, air, or electric powered combination strapping tools.



Signode Power Strapping Machine automatically feeds, tensions, seals and severs the strap in seconds. One operator readily applies strapping more than fast enough for the highest production rates. May be used on cartons, bundles, boxes or bales of varying sizes, giving uniform pre-set tension at the touch of a foot pedal. Completely automatic strapping stations also available.





New Signode Compression Strapping Machine designed specifically for the textile industry makes tight, compact packages or bales that cost less to handle, store, ship and receive. It has a compression capacity of 2,000 pounds and is equipped to feed strap automatically around package or bale. Tensioning and sealing is done with any Signode hand-operated air or electric power combination strapping tool or machine. Resulting denser bales save as much as 7% of valuable space in storage and shipment.

Save Time, Money, Manpower ...the Signode Way

Signode can probably help you find ways to make substantial savings in time, money and manpower. Here are some of the reasons why we think so:

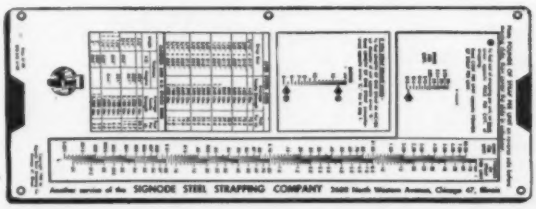
Our line of strapping equipment permits selection of the tool or machine that is right for the job. It includes hand tools, power tools, feeders, presses, and completely automatic machines. Our continuing program of product improvement is backed by 45 years of specialized experience.

The Signode man near you is experienced in the application of this equipment to textile strapping and packaging operations. He also can offer, if needed, the services of Signode's field engineering staff and extensive testing laboratories at no cost to you.

If you have not reviewed your strapping operations quite recently, it will almost certainly pay you to do so, with Signode. Potential savings go beyond the strapping operation....include savings for you in handling, storing, and shipping, plus savings for your customer.

The coupon below is for your convenience.

FREE! NEW Signode Steel Strapping Calculator helps you buy steel strapping at least cost according to your needs, and shows new strength figures for Signode steel strapping.



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☐ Air Power Tensioners & Sealers
☐ Compression Strapping Machines
☐ Power Strapping Machines
☐ Adjusta-Pak 3-way telescoping container
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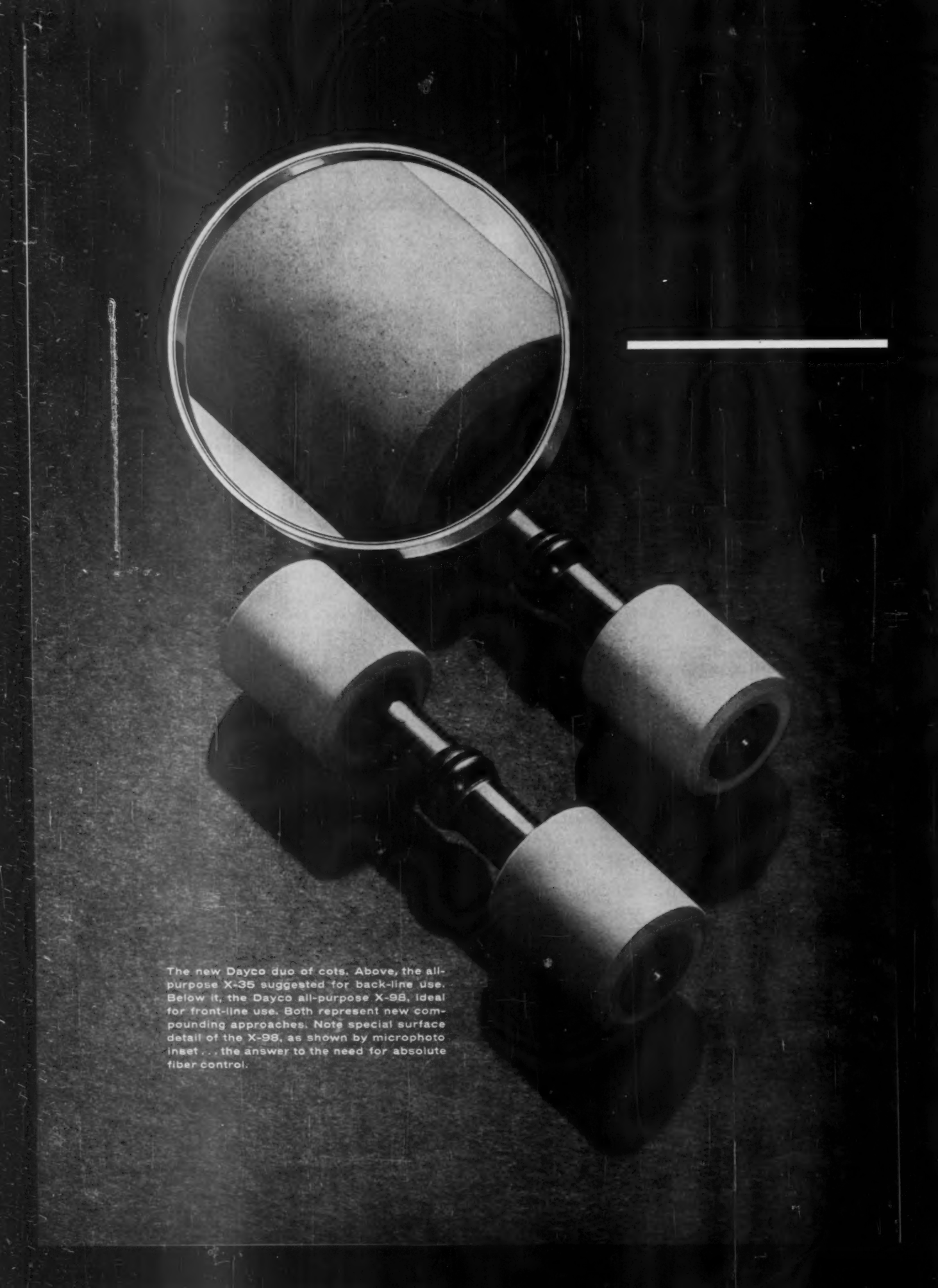


The new Dayco duo of cots. Above, the all-purpose X-35 suggested for back-line use. Below it, the Dayco all-purpose X-98, ideal for front-line use. Both represent new compounding approaches. Note special surface detail of the X-98, as shown by microphoto inset . . . the answer to the need for absolute fiber control.

Dayco Presents Two All New, All Purpose Cots The X35 and X98

New ingredients and special surface give positive yarn control with every fibre— natural, synthetic or blend.

Dayco proudly presents another record-breaking achievement—an outstanding pair of all new, all-purpose cots, the X-35 and the X-98. Compounded with elements never used in cots before, they represent the first major improvement in cot performance offered in many years.

Ideal when used in combination, with the X-35 on the back line and the X-98 on the front, these cots are *all-purpose* in the fullest sense. Both handle any fiber...yarn of any size from 3's to 140's...on any type of system... with greater yarn uniformity and greater efficiency of operation. Even on Dacron and other difficult blends, the X-35 and X-98 show outstanding drafting results.

AN ENTIRELY NEW ELEMENT

The new Dayco X-35 is truly a revolution in cot engineering. Because it is compounded with an entirely new element, its heavy duty surface assures positive grip, breaks up surface tensions on all fibers.

The new Dayco X-98, front-line companion to the X-35, introduces a completely new surface formulation to the textile industry. On the finest or coarsest yarns the Dayco X-98 is a superior performer.

The Dayco X-35 and X-98 have undergone over 12 months of thorough testing under the toughest mill conditions on all types of systems and fibers.

MILL TESTS PROVE SUPERIORITY

Results prove that these new Dayco Cots are top performers. Static problems so common with synthetics are reduced to a new low. Coefficients of friction of the X-35 and X-98 prove ideal for any drafting task. Their lack of affinity for all fibers produces cleaner spinning with less fiber left on the clearers.

Whatever your drafting requirements or equipment, test run the all-purpose Dayco duo—the X-35 and X-98. You can expect to set new high standards in your yarn production, regardless of the fiber.

TRY THE ALL-PURPOSE TEAM

Go Dayco all the way—team up the new advanced Dayco X7 *all-purpose* apron with these revolutionary new *all-purpose* Dayco cots and expect superior drafting performance. You'll get it!

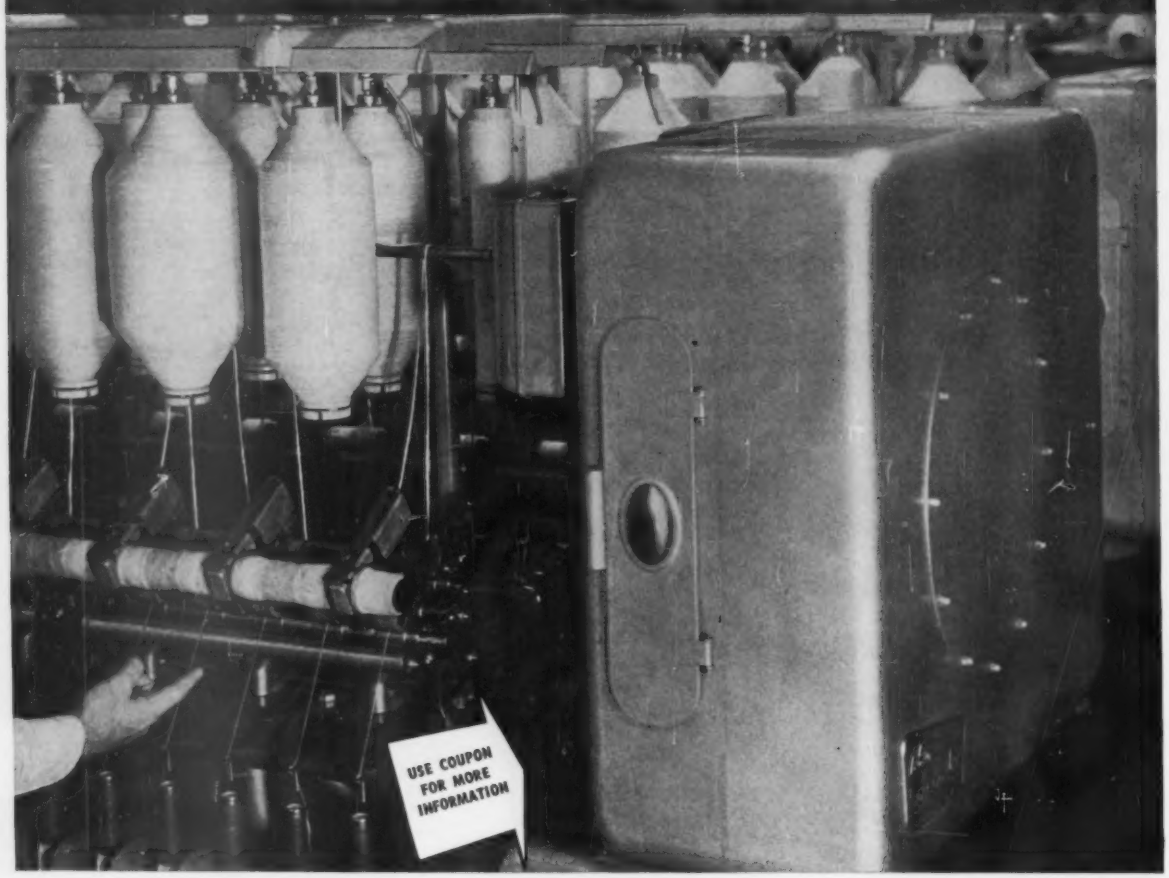
Ask your Dayco Representative to set up a trial installation. Phone or write Dayco Textile Products Co., 401 South Carolina Bank Building, Greenville, S. C. Overseas plant: The Dayton Rubber Co. Ltd., Dundee Scotland.

Dayco TEXTILE PRODUCTS CO. Dayco

Divison of Dayco Corporation

You get additional operating profits with Built-in Economy Features

of BAHNSON COLLECTO-VAC



You can plan for additional operating profits with the extra quality design features of Bahnson's Collecto-Vac for collecting broken ends, lint and fly. Its anodized aluminum flutes neither crack nor warp, thus eliminating replacement costs . . . its rugged all-steel collection box provides durable service indefinitely . . . its scroll type fan gives maximum air handling, helps air distribution in the room by dispersing motor alley heat . . . it has quick, easy access for maintenance.

Collecto-Vac's superior construction enables it to reduce ends down more efficiently, to minimize slubs and gouts, to keep frames and room cleaner. Ask any mill man who has Bahnson Collecto-Vac. Fill in the coupon below for free informative bulletin.

Clip coupon to letterhead. Mail today for Free Illustrated Bulletin 30A.

Name_____

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AIR-O-MATION

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Well Answered

That's the way we feel about a questionnaire we mailed to some mill-management men early in September. The answers they sent back are the basis of our news-making, first-time-anywhere report on electrical practices and electrical management in the textile industry. Our report appears in this issue of TEXTILE WORLD, beginning on page 32. We think it makes significant reading—"must" reading in fact—and we hope you'll give it the study it deserves.

But what we really started out to say is this: We editors, together with every mill-management man who reads this important survey report, are deeply in debt to the busy men who took the time and trouble to answer our questionnaire. It was a long one, and a searching one. The facts their answers brought to light—and the conclusions that grow out of those facts—are essential elements in the textile industry's knowledge of itself. With these facts and these conclusions the industry, collectively and company by company, can appraise itself and spot the areas in which it can—and must—make improvements.

One more thing: The values that come to you as you read this survey report are a measure of the payoff that comes from communication. Indeed, our report strengthens a position we've taken several times on this page: that today's problems in this industry call for free exchange of all sorts of information—business information, technological information, and operating information. When information is freely exchanged, everybody gains—the giver, in helping his industry, and the receiver, in helping his company.

Well Spoken

We're talking about the recent address of J. M. Cheatham before the Greater Charlotte (N.C.) Textile Club. Mr. Cheatham is president of the American Cotton Manufacturers Institute. That position makes him spokesman for a big fraction of the textile industry. His Charlotte speech shows him to be more than a spokesman. It shows him to be a business statesman as well.

Gist of Mr. Cheatham's address was that progress and prosperity in this industry hinge on three things:

- Creation of a public image of the industry that is as pleasing as the industry's image of itself.
- Solution of the imports problem.
- Research on textile technology, products, and markets.

We go right down the line with Mr. Cheatham. We agree that the textile industry's public image needs some repair work (TEXTILE WORLD, September 1960, page 41). We agree that research (or lack of it) can make (or break) the industry (TEXTILE WORLD, July 1960, page 39). And we agree that the imports problem must be solved.

Only place where we differ from Mr. Cheatham is this: We believe that the industry will find its soundest answer to the imports problem—and its only really permanent answer to that problem—not in Washington but in its own bootstrap efforts in technology, product development, and market research (TEXTILE WORLD, November 1960, page 43).

But this one area of difference is no bar to our commending Mr. Cheatham's speech to you. It's a thoughtful speech. It sets forth the industry's most pressing problems clearly, puts them in sense-making perspective, and goes after them straightforwardly. We hope you've heard it—or read it. If you haven't, and if you want a copy of it, we'll be glad to send you one. Write to The Editor, TEXTILE WORLD, 330 West 42nd St., New York 36.

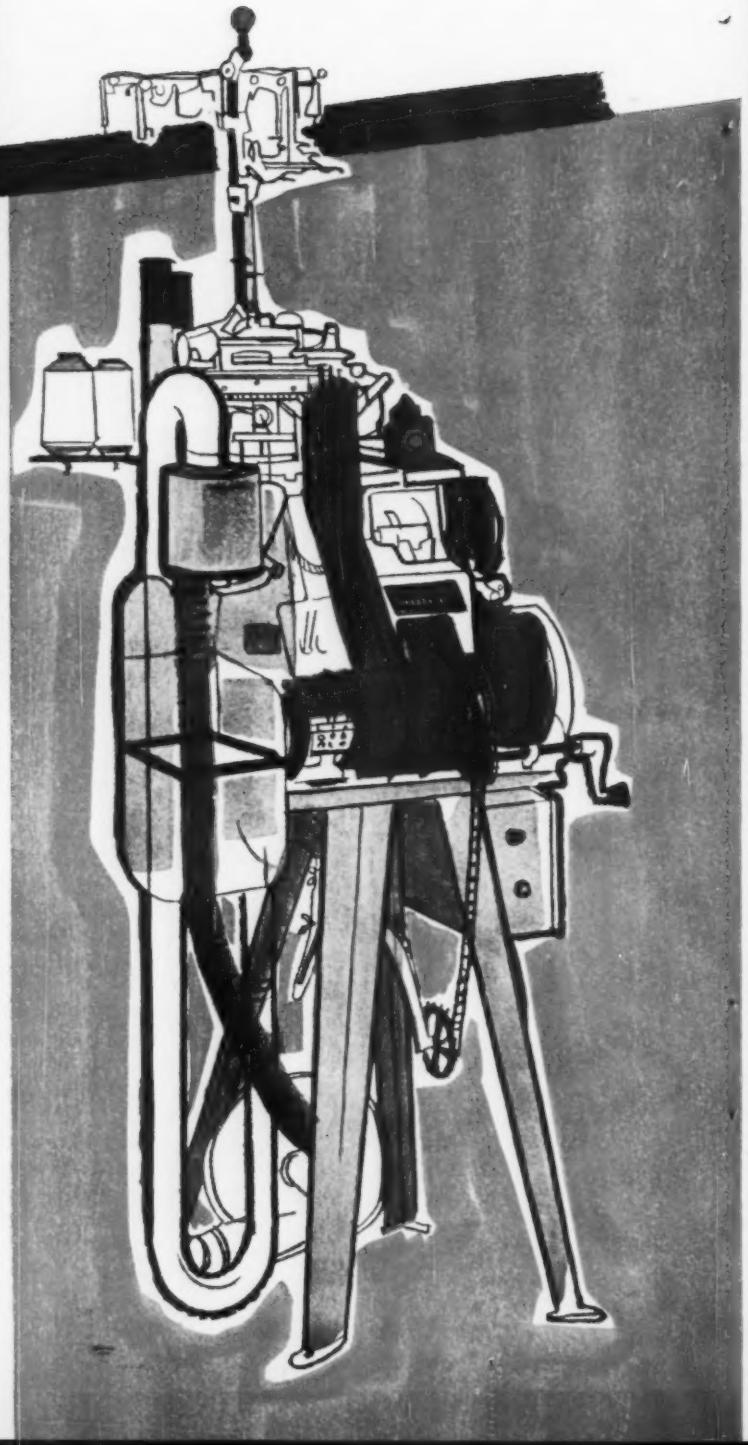
now

peak production

of the finest

seamless

nylon stockings



announcing the new

"Reading-Booton"

twin-feed machine

- 2-feed automatic, highly efficient end trimmer. Trims all ends to a length of from ¼ to ⅜ inch.
- New high standard of fabric quality
- Continuous, high-speed production

The new "Reading-Booton" Twin-Feed Machine opens new profit possibilities in the knitting of ladies' seamless stockings. It gives you twin-feed production, plus amazing simplicity of operation, and trouble-free performance.

New features developed by Textile Machine Works for the proven Booton Machine. This new precision machine belongs in your production planning. Backed by our world-wide service organization. You'll want to see the new "Reading-Booton" in operation before you buy any seamless machine. Call us today.

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TEXTILE WORLD

Management Bulletin

Things you should know about . . .

Pump Standards

New supplement to Standards of the Hydraulic Institute is available. Especially useful to dyeing and finishing management, the supplement includes text clarifications, corrections, and plenty of new information. It's available for $1.25. The Standards list information on centrifugal, rotary, and reciprocating pumps. The whole works—Standards and revision—costs $6. Write Hydraulic Institute, 122 E. 42nd St., New York 17, N. Y.

Executive Salaries

Senior executive salaries are moving closer together, according to McKinsey & Co. surveys. The management consulting firm reports that the typical No. 2 man in the textile industry makes 76% as much as the chief executive, while the No. 3 man makes 64% of the top salary. Indication of things to come: More "telescoping" of top-executive salaries as teamwork management becomes more typical. One expert, Executive Compensation Consultant Warren J. King (Albert Ramond Associates), predicts that by century's end, No. 2 man's pay in durable-goods manufacturing will be as high as 95% of top executive's compensation, while a similar closing of the gap will occur in soft-goods manufacture as well.

Interest Rates

Now's not a bad time to go ahead with the modernization loan you may have been contemplating. Fact is, prime interest rate is now down to 4½%, making the cost of money in America at lowest point in almost two years.

Compensation and Competition

Two new publications you may find helpful: "Analysis of Workmen's Compensation Laws," with all changes made by state legislatures in 1960. Get it from the National Chamber of Commerce, 1615 H St., N.W., Washington 6, for $1. Word on foreign competition comes from the National Association of Manufacturers. Ask NAM (at 2 E. 48th St., New York 17) for "International Competition—A Bigger Job for Marketing Executives."

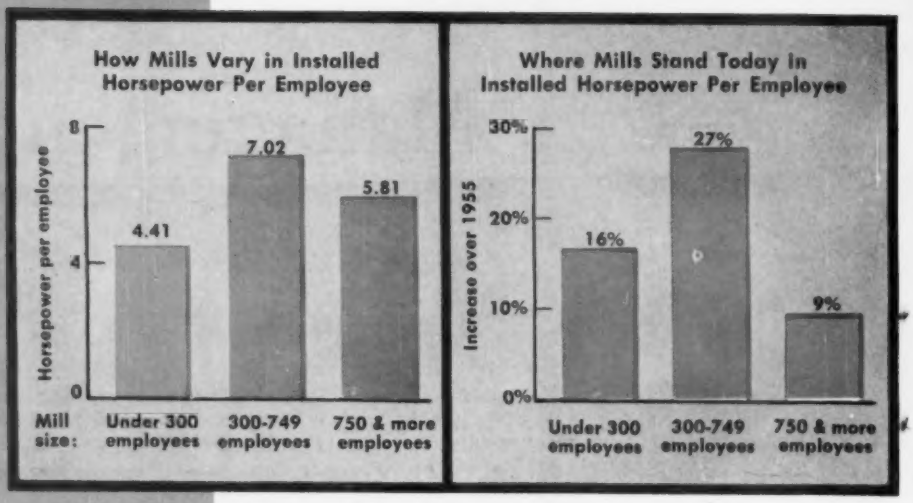
Saving Payday Time

New idea is reducing banking time for hourly workers: Let the local bank set up in-plant banking services for paydays. First National City Bank in New York has tried out this idea, reports employers are happy with scheme. Saves as much as a half hour per employee per payday, tends to cut absenteeism, and also cuts company time used for transaction of personal business. Employees can make use of full range of bank services right in the mill.

Communications

Capsule Review: A book on communications comes highly recommended from the Bureau of National Affairs, Inc. It's called "How to Communicate Policies and Instructions," by Joseph D. Cooper ($14.75). Sample of contents: Why instruction systems fail. Assigning responsibilities. Rules for organizing. Avoiding "officialese" style. Planning the employee handbook. Planning production checklists. Plus other communications tips.

How Mills Use Power Today



About this survey—

This is a survey of management and practices in the use of electric power in textile mills. In these pages you will find replies that management men and specialists in 98 textile-producing units gave to a jam-packed 4-page TEXTILE WORLD questionnaire.

Who are these men? They include presidents, vice presidents, general managers, superintendents, chief engineers, electrical engineers, master mechanics, and the like. Their mills stretch from Maine to Texas. Their operations cover preparation and spinning, weaving, knitting, dyeing and finishing. Annual sales of their mills and companies range from $250,000 to $113,000,000. In size, their operations employ from about 100 workers all the way up to 10,00—even 60,000 in one instance. For electrical maintenance and repair they spend from $500 to $460,000 a year.

The biggest single group of replies to the questionnaire comes from mills in the middle size range; that is, mills with 300-749 employees. Among the total 98 mills replying, 44 are in this range. From mills with 750 or more employees come 28 replies. From mills with fewer than 300 employees, 26 replies.

and how you can use it

We can suggest five ways, as follows:

- TO LEARN about the present status of electric power distribution, utilization, and management in a substantial cross section of the industry.
- TO SEE how fast you'll have to move to keep up with the parade of electrical progress.
- TO HELP you put your finger on the electrical soft spots in your mill.
- TO FIND OUT how other mills manage, update, maintain, and use their power systems.
- TO GET HELP for your own problems.

One word of caution: Though the percentage of returns is pretty high (as surveys go generally), the 98 respondent mills still are only a fraction of the whole industry. It would be unwise (and statistically unsound) to project the findings to the entire industry.

Special Survey Report

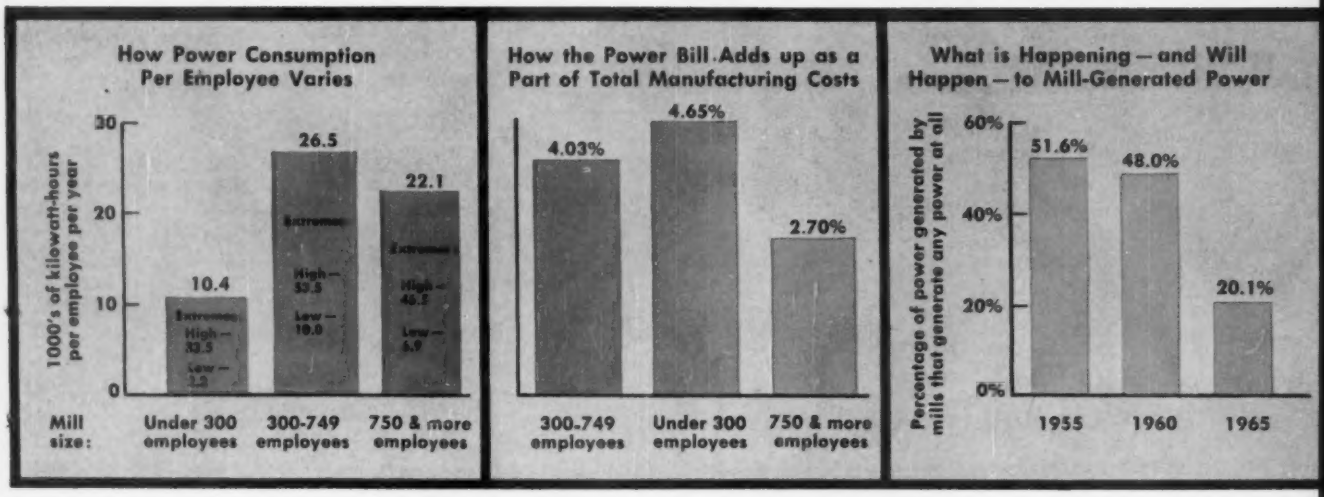
Electric

This is a first-of-its-kind report on the textile industry. It will tell you . . . where mills stand today in power utilization . . . how they manage their electrical systems . . . where their systems are strong, where weak . . . where the industry is headed electrically

NOW, for the first time anywhere, you can find out the facts about electric power in a substantial part of the textile industry. The facts come up clear in a survey just made by the editors of TEXTILE WORLD (see "About This Survey—and How You Can Use It" in the adjoining column). You'll find the report of this survey beginning on these two pages and continuing on the six pages that follow.

What are the major findings of this survey? Here they are, at a glance:

- **Electric power has become a bigger factor in today's textile industry** than many an outsider thinks. The rate at which power use has grown—and is growing—is a measure of the industry's speed in mechanization.
- **Power consumption will continue to grow.** How much? Just about 23% in the next five years. That's a good, solid increase.
- **The pace of modernization in the industry is quick.**



Power in Textiles: 1961

Electric and electronic controls, for instance, are catching on fast.

• **Answers are turning up for some old, familiar problems.** For instance, many mills report that they are having less trouble today than they had five years ago with lint, heat, humidity, and dust—the ancient enemies of long motor life and best performance.

• **A substantial number of mills have been getting by** on out-of-date electrical methods, equipment, and standards. Right now, a good many of them are running on borrowed time—and simply postponing the evil day when they'll have to pay the price of obsolescence. In fact, the penalty for obsolescence will increase as the advance in textile technology picks up speed.

• **Mill management men see electrical growth ahead.** But not enough of them are planning for it. Yet a good many mills right now are paying the price of their failure to plan for the electrical growth that took place over the past five years.

• **A change in incoming primary voltage is long overdue** in a good many mills. Even among the biggest mills, where you would most expect to find higher incoming voltages, 25% take their incoming power at 600 volts or lower.

• **The percent of power generated by the mills themselves has been falling off**—and is slated to drop sharply in the next five years.

• **There is lots of room for tightening up the management of electrical maintenance.**

• **Lighting levels hover around 50% of what they should be.** In fact, a good many mills don't even know what lighting levels are on the manufacturing floor.

Where Power Use Stands Today

Installed horsepower—It's rising now, with today's average at 4,967 horsepower for the mills replying to this question, compared with 4,756 in 1955. The average will increase to 6,142 by 1965.

In the below-300-employee group of mills, installed horsepower per employee averages 4.41, with a range from 0.65 to 13.2. In the 300-to-749-employee group of mills, the average is 7.02, with a high of 10.9 and a low of 0.3. In the over-750-employee group the average is 5.81; the high, 20.0; the low, 0.85.

No one type of mill or product dominates the high group. It includes spinning-weaving-finishing plants, combed-yarn mills, gray-goods mills, and many others. The lowest horsepower-per-employee ratios prevail among the dyeing and finishing group and among the hosiery and sweater manufacturers.

Power used per employee—Power consumption per year per employee ranges all up and down the scale, according to questionnaire respondents. At any rate, no consistent pattern emerges from the data. If there is one observation to be made, it is that the smaller plants, as expected, generally use fewer kilowatt-hours per employee. The accompanying chart, showing averages and extreme highs and lows, supports this observation.

How much for power?—On averages, for the 37 mills that reported on this question (four respondents obviously misunderstood the question and their replies therefore were not counted into the total), power costs come to 3.11% of total manufacturing costs. Top percentage reported in 10%; low, 0.3%.

Ratio of power cost to manufacturing cost runs somewhat higher among the small and middle-sized

mills than among the big mills. One likely explanation: The biggest companies buy the biggest blocks of power and thus get the lowest rates. What's more, the biggest mills are likely to own the substation, thus don't have to help the utility pay the cost of transformer amortization and maintenance.

Are power costs important? Take it this way: If the power bill runs to 3.11% of total manufacturing costs, it **is** a cost to be reckoned with. For many a mill, 3.11% is as much as its net profit. **Moral:** You can't shrug off electric power as a negligible cost. There are many real opportunities for saving money by better distribution and better utilization. Every time you can cash in on one of these opportunities you're putting yourself that much ahead.

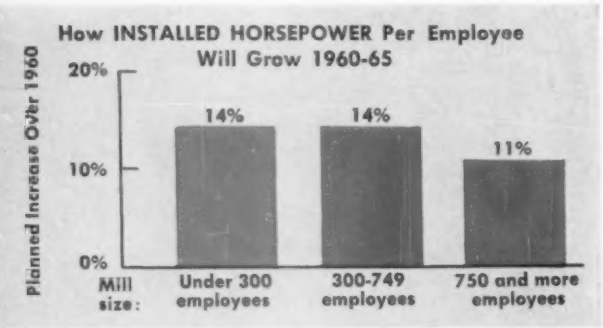
Mill-generated power—Only 12 out of the 98 mills reporting are now, in 1961, generating any part of the power they use. Among those mill that do generate some power, the range is from 10% to 95% of their total power consumption. All together, the plants that generate power for their own use today produce an average of 48% of the power they use.

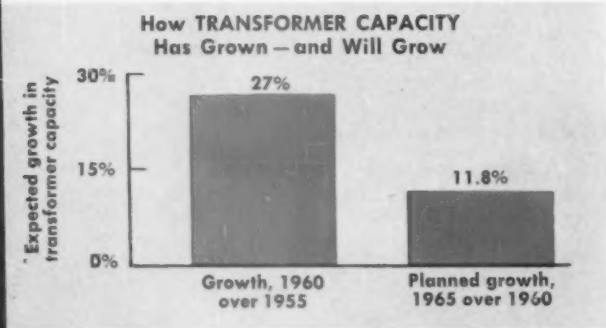
By 1965, no one of these 12 mills will generate more than 55% of the power it uses. And between now and 1965 only one of these 12 mills will increase its percentage of power generated. One will hold steady on its present precentage, and five will abandon all generation of power.

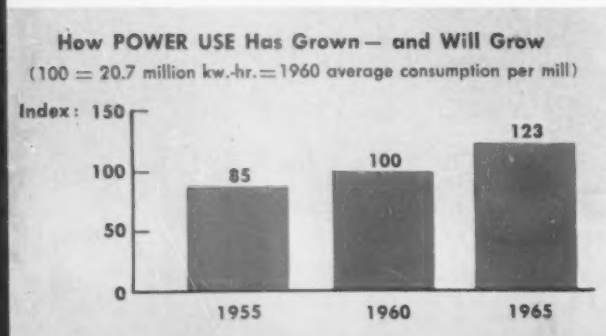
Fact is, the rate at which mills expect to abandon their generating facilities will pick up speed in the next five years. Mill generating equipment is wearing out now, and utility rates that once seemed high now look pretty favorable when engineers lay them alongside the cost of new generating equipment. As mills abandon their own generating facilities, generating capacity, of course, will have to be replaced by transformer capacity in most instances, and circuit-breaker interrupting capacity will have to be substantially increased.

Lineshaft group drives—Ninety-five mill men reported on this question. None of them reported that all of their production equipment is driven by lineshaft group drives. On the other hand, 38% of them reported none of their machines are driven this way. Fifty-nine percent of them reported "Some."

Electric Power for Tomorrow's Mills







Growing horsepower—As for planned growth of installed horsepower 1960-65 (that is, the rate at which additional motors will be installed in textile mills), the trend is unmistakable. It's upward (see graph), continuing the trend already established from 1955 to 1960. There's no significant difference in the rates of growth planned by the three major size groups of mills.

Between 1955 and 1960 the average mill reporting increased its installed horsepower per employee by 19%. In the five years ahead the 32 mills that were willing to project said their installed capacity per employee would increase 13% above 1960. Fastest growth predicted by any mill is 75%. Most of the others talk of growth close to the average of 13%.

Transformer capacity up—Like horsepower per employee, substation transformer capacity is marked for growth (see graph). In the past five years, 1955-60, average transformer capacity increased 27% to 4,982 kva. among the 66 mills that answered this question. In the five years ahead, 1960-65, this average figure (according to the 28 mills who were willing to look that far ahead) will increase 11.8% to 5,570 kva.

In general the larger mills tend to be more conservative in predicting their growth rate in this respect. Twelve of them predicted only a 3% increase by

How main TRANSFORMER CAPACITY vs. demand shows up in mills today

Margin of capacity over demand—1960 (Percent)

Number of employees in mill	Maximum	Average	Minimum
Under 300	125%	22%	−10%
300–749	235%	39%	−13%
750 and over	110%	39%	0%

1965. But 16 out of the 28 mills of all sizes that answered this question predicted their present capacity would carry them through the next five years. The middle group of mills (300-749 employees) will add 18% to their transformer capacity by 1965.

Power use growing—Annual power consumption data confirm the growth trends that show up elsewhere in the survey. In 1960 the 65 mills that reported their total power consumption used an average of 20.7-million kilowatt-hours per year. This was 17% higher than the average reported for 1955. The 20 mills that projected their power consumption five years ahead to 1965 see an average figure of 25.6-million kilowatt-hours—23% above 1960. That's real growth.

Noteworthy in the data: As you move from small to middle-size to big mills, there's surprisingly little difference in what they expect by way of increase in power consumption. Of the 20 mills that looked five years ahead in answering the survey question, 15 expect a substantial increase in their power use.

How much excess capacity?—A survey made two years ago by FACTORY, another McGraw-Hill magazine, showed that plants in all manufacturing industries were operating with an average 60% margin of excess transformer capacity over peak demand. Today's Textile World survey of the textile industry shows an average margin of 36%—substantially below that of other manufacturing industries.

Distributing Power in the Mill

Incoming voltages—Compared with a cross section of plants in all the manufacturing industries, a great many more textile mills are limited to 600-volt incoming voltage and below. As the table shows, these low voltages are still being used even by 26% of the biggest textile mills.

Granted, this low primary voltage (an anachronism for big mills) may make sense for the small mill. But it is unsound economically, and obsolete also, for the great majority of good-size mills.

Two things probably account for such a high percentage of good-size mills with low incoming voltages: (1) the practice of buying power at distribution voltage (with low-voltage metering), thus avoiding the need for investment in primary transformer and substations; and (2) the practice of letting electrical systems "grow" by adding and patching from year to year.

Surely, if they had opportunity to do it over again, many of these mills would have replaced their cumbersome, expensive 550-, 440-, and 220-volt equipment with modern high-primary-voltage transformers, breakers, and switchgear.

Primary distribution additions—Mill owners in the last five years have added measurably to their primary distribution systems. Of the mills that answered the question, 52% have added circuit breakers (average units installed, 25.5), 62% have added primary feeder circuits (average units installed, 4.8), and 42% have added primary transformers (average units installed, 3.5). That's a lot of addition.

With more mills adding feeder circuits than transformers, it is reasonable to suppose that most mills have enough surplus transformer capacity to permit substantial additions of feeder circuits.

Since the transformer is the most expensive single piece of distribution equipment, it is significant that 42% of the mills have made additions in the last five years. It is also significant that there appears a 12-year cycle (42% replacement in 5 years, 100% in about 12 years) for addition to transformer capacity in textile mills. In other words, it would appear that the average

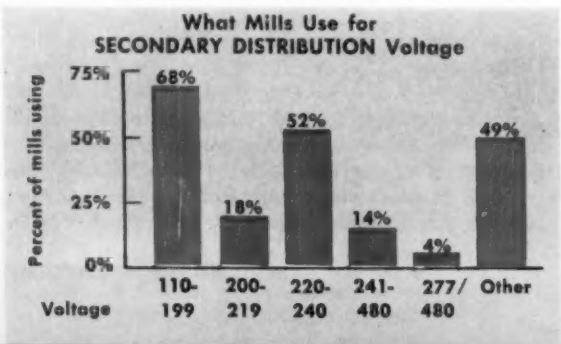
What mills use as INCOMING VOLTAGE

(Totals add to over 100% because some mills report more than one incoming voltage)

	Mills Using These Voltages			
	Under 300 Employees	300-749 Employees	750 and More Employees	All Mills Reporting
Number of mills answering this question	24	42	27	93
Incoming voltage:				
600 or below	50%	43%	26%	40%
601–5000	25%	14%	26%	20%
5001–13,800	21%	26%	33%	27%
13,800 and over	4%	24%	26%	0%

What mills use for SECONDARY CONDUCTORS

Conductor	Percent of Responding Mills Now Using	Percent of these mills: Expecting to Use More	Expecting to Use Less	Making No Estimate
Conduit and wire	94%	60%	10%	30%
Bus duct	48	60	11	29
Exposed wiring, insulator mounted	28	8	65	27
Cable in tray	19	45	23	32
Flexible armored cable	42	49	31	20
Others	3	....	....	....



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textile mill outgrows its transformer capacity in about 12 years. This is about par for the course among all the manufacturing industries.

Secondary voltages—As the graph shows, the majority of textile mills today use more than one voltage for secondary distribution. (The "Other" voltage shown on the graph is 550, which 49% of the respondents report they use.) There is no clear-cut pattern on these voltages, except that the smaller mills (under 300 employees) lean to 110- to 240-volt systems.

What is surprising is that in spite of urgings by engineering groups and equipment manufacturers for some years now, only 4% of the responding mills have thus far installed a 277/480-volt system.

Secondary conductors—Conduit is the big favorite in the respondent textile mills, as the table shows. What's more, it is destined to find even wider use in most mills. Bus duct and cable tray also have moved in strong.

Exposed wiring (insulator mounted) is on the way out. High time, too. Even so, there's cause for surprise in the report that 8% of the mills that now use open wiring expect to use still more of it in the future.

Unit substations—Among the under-300-employee group of mills, about 33% now have one or more metal-clad unit substations—about the same number that had these units in 1955. Among the 300-to-749-employee group, 57% now have these units, compared with 45% that had them five years ago. And among the biggest mills, 61% now have them, against 53% that had them in 1955. Over-all, in all three groups of mills, 53% now are using unit substations today, against 47% in 1955.

Among the 51 mills that report they have unit substations today, average number of units owned is 4.8. One big outfit owns 24. Naturally, the big mills own more (average of 8.5 per mill).

Comparing 1955 with 1960, 26 mills report that they own more unit substations now than they did five years ago. The trend is clear: More unit substations. But they are coming in slowly.

Grounding—About 68% of the responding mills report that their secondary system is grounded.

Any direct current?—Yes. Of the 94 respondents who answered this question, 26 report they have some d.-c. distribution. In age, these systems range from 5 to 60 years, with an average of 20 years.

Fifteen of these d.-c. systems supply power to equipment for dyeing, bleaching, printing, and slashing. The remaining 11 systems are used for non-textile-machine drives, such as elevators, machine tools, cranes, and speed controls—and for emergency lighting.

Planning and Engineering the System

How mills plan their major electrical projects

	Under 300 Employees	300-749 Employees	750 and More Employees	All Mills
	Percent of mills reporting			
Plan ahead:				
1 year	4%	10%	25%	13%
2 years	0%	2%	21%	7%
3 years and more	12%	10%	14%	11%
No set policy	84%	78%	40%	69%

Making plans—How far ahead should a mill plan major alterations to its electrical system? Certainly far enough ahead to get them within the budget period. No plans—no money appropriated. Yet 69% of the mills responding to the survey question have no set policy for planning major electrical expenditures.

As you might expect, there is substantially more forward planning among the 750-and-more-employee group of mills than among the middle-size and small mills. Even among the big plants, though, 40% have no set policy for forward planning.

Lead time between planning and acting, of course, depends in part on how much engineering time is available and on the time required for delivery and installation of equipment. But management men in most mills certainly should be able to come up with some realistic policy that will tell the electrical-engineering supervisor how far ahead he can—and should—plan major improvements in the electrical system.

Putting plans to work—Of 97 mills that replied on this subject, only 14 report that they are now postponing any important improvements in their electrical distribution systems. For the rest, presumably, plans are coming to fruition on schedule.

What reasons are given by mills that are postponing improvements? Some mills give more than one reason. Others, only one. Here's the way the reasons run:

Lack of funds for capital expenditure	8
Equipment or installation cost too high	3
Not enough time to study problem and prepare a report	3
Top management unconvinced the project is important	2
Management pessimistic about business outlook	2
No salvage value for equipment being replaced	1
Other reasons	3

It's encouraging to learn that in spite of a current market dip and some gloomy talk within the industry about its profits outlook, only 14 out of 97 mills are postponing major improvements. The remainder presumably will go right ahead with their plans.

Load surveys—In answer to the question "When was the last over-all system load survey made in your mill?" respondents in 13 mills said they don't know and 11 said it was over five years ago. These two groups add up to 25% of those that replied.

Yet many of the mills in this 25% group gave data from which is derived this survey's finding that power consumption in the average mill will grow 23% in the next five years. If these mills keep on postponing routine, regular load surveys while they add power-consuming equipment over the next five years, they will be headed for real overload trouble.

Fortunately for the textile industry (and the mills involved), 29 of the respondent mills make these system-load surveys on a continuing basis. Within the past two years another 29 have made a survey; within the past 2 to 5 years, 14.

Voltage at point of use—Within the last two years 87 of the 98 mills reporting have made a load-voltage check at point of utilization. Since this is the easiest kind of check to run, the high percentage is not surprising. But the data do indicate that in the remaining 11 mills (out of the total 98), nobody has even taken a voltmeter onto the mill floor for two years.

Of these 87 mills, 58% report that "All" their equipment is supplied at 95% or more of rated voltage; 38% report that "Most" of their equipment is so supplied; 2% report "Some"; and 2% report "None."

When you consider that 95% of rated voltage is the lowest tolerable voltage for most equipment, the fact that 42% of the respondent mills supply at least part of their equipment at less than 95% is nothing to boast about. Look at it this way. At 95% of normal voltage incandescent lamps give only 80% of their rated output. Motors take longer to start, and they overheat when they run. And heaters produce only 90% of normal heat. In fact, when voltage is below 95% at the point of utilization, the mill pays a performance penalty on almost everything connected to the electrcial system.

Cost of downtime—Of the 89 mills that answered the question on downtime costs, only 9% report that they have a cost-per-minute figure. And of those few that report a figure, none report a figure that could possibly include the cost of wages and overhead.

This lack of a meaningful, realistic figure is a dangerous weakness in textile-mill electrical management. Key decisions on whether to improve the electrical system turn on the penalty the mill must pay for electrical failure. Yet 91% of the mills reporting apparently have never calculated this penalty in its only really useful form—cost in dollars per minute for shutdowns of various durations.

Emergency power—Only 18 out of the 98 mills reporting say they have any emergency power source. Where such equipment is installed, its average age is 8.9 years. Some of it was new in 1959 or 1960. Some of it is as much as 32 years old.

Lack of an emergency power source in so many mills is disturbing. Why? Because much of the textile industry is in the Southeast, where the high incidence of lightning is a threat to continuity of mill operations. What's more, much of the textile industry relies on three-shift operation to trim overhead costs. When a power outage causes a shutdown on any shift, this solution to a tough economic problem is in jeopardy. One more thing: With three-shift schedules, emergency power for lighting is a "must" to protect workers in case of outage on second and third shifts.

Retire or rewind?—Interestingly enough, only 3 mills out of the 97 replying have a policy that retires motors on age alone. Yet many doubtless take age into account along with other factors. The three mills that do set age limits set them at 15, 30, and 40 years respectively. Four mills report that they rewind ball-bearing or lint-free bearing motors only. Three rewind textile-type motors only. Two mills do not rewind motors if they are too large or too heavy for modern mountings.

Two reasons why old mill motors don't get retired as early as in some other manufacturing industries: (1) About 60% of the survey respondents choose between rewinding and replacing solely on the basis of cost; and (2) 24% of the respondents have no firm policy.

Power factor—The survey indicates that textile-mill power factors are reasonably high (see table below). Of the 77 mills replying to this question, 43% report power factor of 0.90 or higher. Only 15% report their power factor is below 0.80.

Suppose your utility doesn't impose a penalty for low power factor. Should you worry about power factor? The answer is yes—for other reasons: When power factor drops below 0.80, the loss in system capacity becomes significant. Capacity of your conductors, your breakers, and your transformers is used up in circulating non-working current.

Here's the way the replies add up:

How mills report their power factor (average)

	Percent of respondent mills
Power factor 0.95. or higher	20%
0.90 to 0.94	23%
0.85 to 0.89	22%
0.80 to 0.84	20%
0.75 to 0.79	14%
0.70 or below	1%

Roots of trouble—Replies to the survey questions indicate mill men are surely if perhaps slowly solving the environmental problems that cause trouble in motors and controls. The middle table, on page 60 tells the story. Of the 93 mill men who answered this question, only 7% think these problems are "More" difficult now than they were five years ago, 62% say they are about as bad, and 31% report "Less" difficulty. This 31% figure is encouraging.

The figures show that the big threats to mill motors and controls are lint, heat, humidity, and dust, with lint at the very top of the list. Fifth in the list is "operator carelessness."

How much light?—Among the 54 mills that answered this question, 30% said they don't know what

. . . *Turn the page*

How textile mills use air conditioning . . .

. . . in manufacturing areas

Number of mills reporting	Under 300 Employees	300-749 Employees	750 and More Employees	All Mills
	Number of Mills			
	24	40	25	89
Percent of area air conditioned:				
0%	14	18	8	40
10% or less	5	6	5	16
11 to 25%	..	4	2	6
26 to 75%	1	8	8	17
76% and over	4	4	2	10

. . . and in office areas

Number of mills reporting	22	43	24	89
Percent of area air conditioned:				
0%	7	8	..	15
10% or less	..	3	1	4
26 to 75%	..	5	2	7
76% and over	15	26	21	63

What causes trouble in motors and controls

Cause of Trouble	Percent of Mill Men Reporting Trouble	Percent of Operators Reporting Difficulty of Problem Compared with 5 Years Ago		
		More	Less	Same
Lint	70%	7%	35%	58%
Heat	38	12	28	60
Humidity	38	3	20	7
Dust	31	7	22	71
Operator carelessness	24	15	45	40
Splashed liquids	20	3	22	73
Improper maintenance	16	0	42	58
Corrosive fumes	10	0	20	80
Vibration	16	7	7	86
Improper voltage	3	0	50	50
Other	6	25	50	25

What textile men say about controls

Area	Percent of Mills That Have Added Controls	Percent Reporting Experience With Controls	
		Good	Fair
Finishing	45%	93%	7%
Dyeing	37	86	14
Roving	26	77	23
Blending and picking	24	100	0
Weaving	19	91	9
Carding/combing	18	90	10
Spinning	16	80	20
Knitting	16	90	10
Bleaching	16	89	11
Cloth room	8	100	0

SURVEY REPORT:

POWER IN TEXTILES . . . *Begins on page 32*

lighting levels are anywhere in the mill. Among those that do report a figure, the typical mill area is lighted at only 50% of IES (Illuminating Engineering Society) recommendations, as revised in 1958.

The accompanying chart (facing page) shows where textile mills stand today in illumination. Only in opening and picking areas do levels approach IES standards—30 foot-candles. The range among the small mills (under 300 employees) runs from a low of 25 to a high of 32 foot-candles. The average is 28.5 foot-candles—just barely under the minimum. Everywhere else in the mills lighting levels are even further below minimum. In no one of the three size groups of mills does average foot-candles come up to IES minimum for any mill area. In areas like dyeing and finishing, maximum foot-candles is far below the minimum IES standard.

How much change in lighting?—About 52% of the plants reporting say they have made some major change in lighting equipment or lighting levels in the past two years. This is encouraging. But textile mills still have a long way to go to get all the advantages of really adequate lighting, because lighting-equipment improvement has come along fast in recent years. Lamp and fixture manufacturers have introduced new lamps with greater efficiency and better color characteristics, and fixtures that are brighter yet more comfortable and easier to keep clean.

Lamp replacement—In spite of the rising cost of maintenance labor and the fast-accumulating evidence that lamp-by-lamp replacement is the high-priced way to relamp, only 16% of the mills reporting say that they handle lamp replacement on a group basis.

How much air conditioning?—With so many mills located in the Southeast, it is surprising that as many as 45% of those reporting have no air conditioning in their manufacturing areas (see table). About 44% air condition more than 10% and less than 76% of their manufacturing area. And 11% have completely or almost completely air conditioned their manufacturing areas.

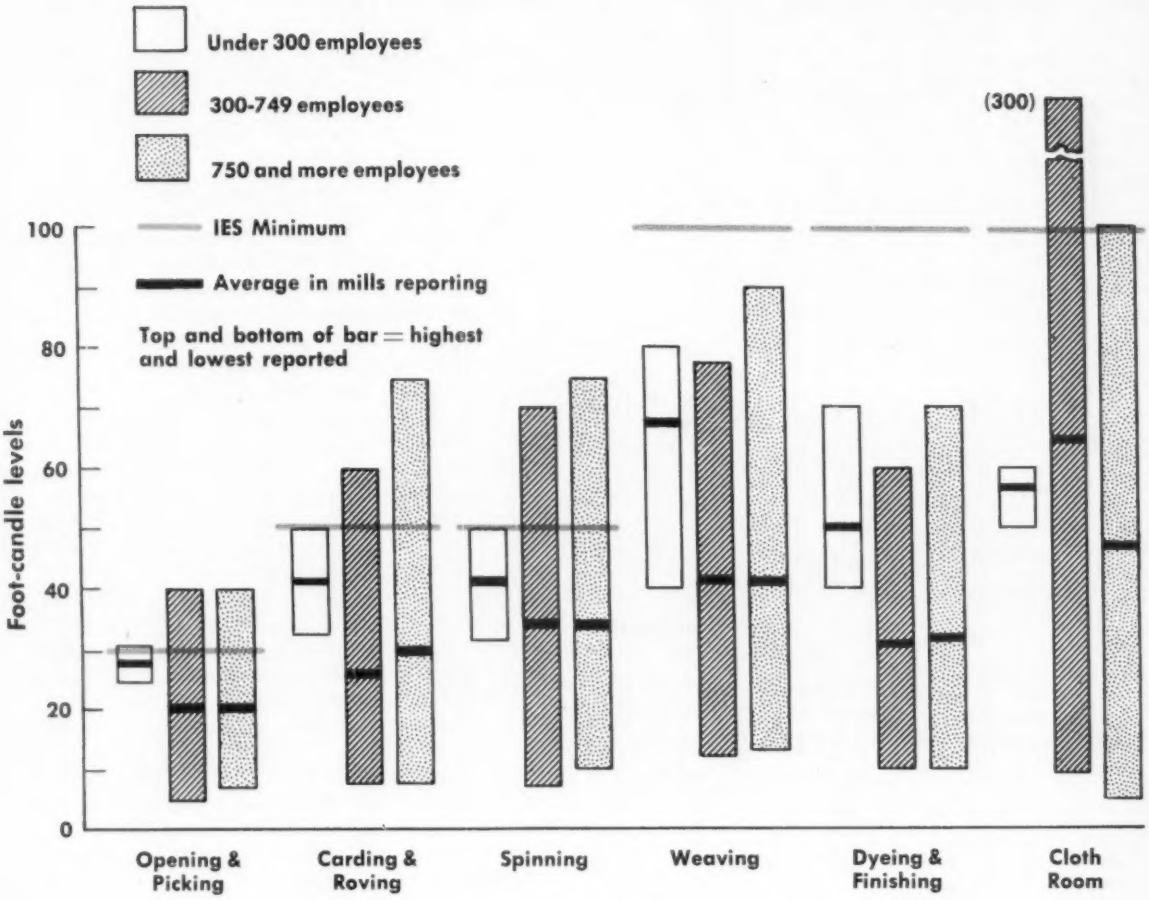
Office areas fare somewhat better. Some 71% of the mills reporting have air conditioned more than 75% of their office areas. Only 17% have no air conditioned office space.

How many controls?—Of the 93 mills replying to this question, 72% report that they have added electric or electronic controls to their equipment. By size, 68% of the small mills (under 300 employees) report they have installed these controls; 66% of the mills in the middle-size group; 85% in the big-mill group.

Where are most of these controls applied? In finishing and dyeing (see table). Fewest? In the cloth room. Elsewhere there's a pretty healthy willingness to give controls a try.

Experience with controls? It's mostly good.

How Lighting Levels in Mills Show up Against IES Standards



Managing Electric Power in the Mill

Who's in charge?—Among the men responsible for electrical design and engineering work, engineering titles lead the list at 33—chief engineer, plant engineer, engineering department head, and the like. There are 23 electrical titles—electrical engineer, electrical supervisor, electrical project engineer, and chief electrician, to mention several—and 11 maintenance titles, including superintendent of maintenance, maintenance manager, maintenance foreman, and maintenance engineer.

These men in charge of design and engineering report up the line to 27 top management titles (8 to the president, 5 to the general manager, 5 to various vice presidents), 33 production titles (10 to plant managers, 15 to superintendents), and 7 to engineering titles (7 to chief engineers, 5 to plant engineers). Only 3 report up the line to maintenance titles. Sixty-two of these men are located right in the respondent mill. The remaining 31 have headquarters elsewhere. In 43 of the mills replying this man has other mills under his authority as well as the respondent mill.

Thirty-three electrical repair and maintenance men bear electrical titles (including head electrician, chief electrician, plant electrician, electrical department manager, electrical foreman), 27 carry maintenance titles (including manager, superintendent, chief, foreman, and master mechanic), and 11 carry engineering titles (plant engineer or chief engineer).

These electrical maintenance chiefs report to 24 production titles (for instance, plant superintendent, assistant superintendent, and mechanics superintendent), 20 management titles (president, general manager, plant manager, and the like), 13 engineering titles (including plant engineer, chief engineer, maintenance engineer, and electrical engineer), and a scattering of other titles.

. . . Turn the page

How electrical know-how is used in design and in maintenance

Level of Training	Percent of mills using the various training levels							
	Under 100 Employees		300-750 Emp.		750 and More Employees		All Mills	
	Design	Mtce.	Design	Mtce.	Design	Mtce.	Design	Mtce.
Graduate electrical engineer..	15%	0%	35%	5%	33%	10%	29%	5%
Graduate mechanical (or other) engineer..	24%	9%	19%	7%	23%	10%	22%	8%
Experienced electrician.	46%	78%	30%	74%	27%	76%	33%	76%
Other.....	15%	13%	16%	14%	17%	4%	16%	11%

How mills contract their electrical work to outsiders

Amount of Work	Percent of mills that contract to outsiders	
	Electrical Engineering and Design	Electrical Maintenance and Repair
None.....	43%	70%
Some.....	37%	22%
Most.....	12%	4%
All.....	8%	4%

How electrical-maintenance scheduling looks among textile mills

	Number of mills that schedule . . . of their daily work	Number of mills that complete . . . of their scheduled work on schedule	In this many mills, . . of unscheduled work is emergency work
All.....	4	9	7
Over half....	12	19	7
About half...	23	16	7
Under half...	17	7	33
None.....	0	1	1

SURVEY REPORT: POWER IN TEXTILES

. . . *Begins on page* 32

Level of training—Electrical design work is more likely to fall to a graduate electrical (or mechanical) engineer than to the experienced electrician in the mill, as the table shows. That is just what you would expect. In contrast, few mill use their graduate engineers to supervise electrical maintenance and repair.

Would mills improve their electrical efficiency by bringing more of the skills of graduate electrical engineers to bear on their electrical maintenance and management problems? That's a question to ponder.

Outside contracting—As you would expect, textile mills are more willing to contract their electrical engineering and design to outsiders than their electrical maintenance (see table). As would be expected, most mills find that maintenance and repair is easier to manage with mill people than engineering and design.

It is not surprising that most of the mills that contract "All" or "Most" of their system design projects fall into the smallest size group (under 300 employees). Same thing holds for farming out "All" or "Most" of their system maintenance work.

Scheduled work—Scheduling and performance to schedule are key indicators of efficiency in electrical (and any other) management. But of the 95 mills that answered a question on scheduling, 37 report that they do not set up daily electrical maintenance schedules. As expected, the percentage of mills that do schedule this work is highest (72%) in the 750-and-more-employee group, next highest (67%) in the 350-to-749-employee group, and lowest (27%) in the under-300-employee group. The accompanying table tells the story on scheduling—and on meeting schedules.

Spotting trouble—Of the 96 mills that replied to this question, 57 report that they have specially trained people for troubleshooting controls and instruments. Among the small-mill group 48% have such experts; the middle-size group, 56%; the biggest mills, 79%.

If you are surprised at the number of small mills that are staffed with these experts, take a look (above in this survey) at the percentage (68%) of small mills that have installed some electrical or electronic controls.

Safety—Of the 98 mills replying, 24 reported an electrical fire (damage over $100) in the past two years. That's about par for the course among all manufacturing industries.

Causes of these fires? Defective cable led the list as the cause of 6 fires; defective equipment, 4; overload, 3. Twelve respondents cited "Other" causes, including lightning (3) and insulation failure (2).

Only 4 of the 98 mills reported any lost-time accident chargeable to electricity in the last two years. A pretty good record.

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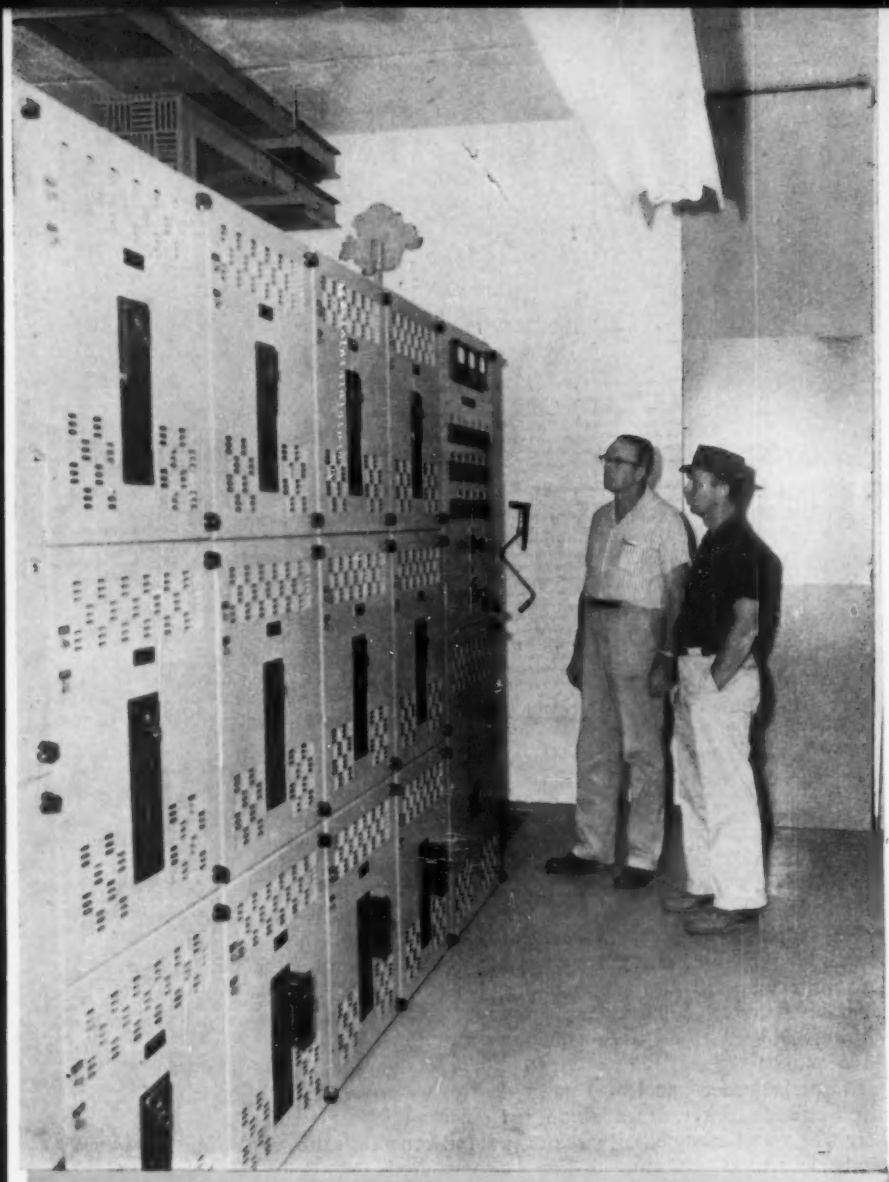


New Power System Cures Headaches

Eighteen months ago electrical problems were eye-high at this medium-sized mill. Today, there just aren't any problems to speak of—because management decided to go ahead with a whole new electrical system.

IF YOUR MILL was built more than 10 years ago, no doubt you're up against the same problem Canton Cotton Mills (Canton, Ga.) faced 18 months ago. Its No. 2 Mill had electrical equipment that was completely outdated and inadequate for its needs.

What did Canton do? It refurbished the mill with a complete new electrical system (see photos). It did these things:

Built in enough capacity to carry the mill through the next 15 years —maybe 20.

Constructed a brand-new switchgear room as a major step toward insuring itself against disastrous (and costly) feeder-cable faults.

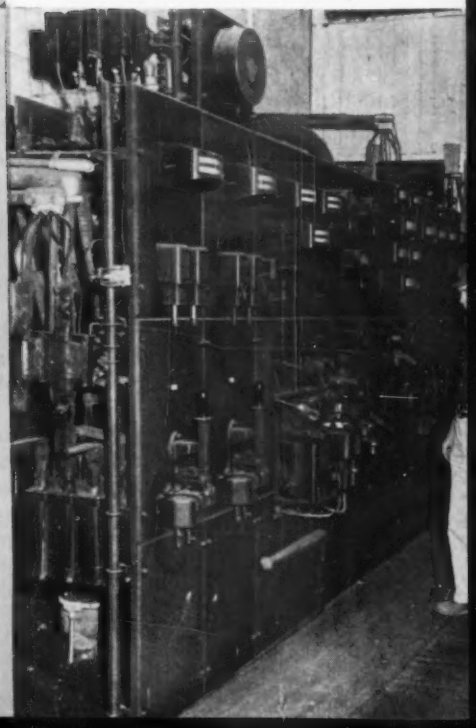
Made its new system doubly flexible by putting a stand-by set of switchgear right next to the primary switchgear.

Put new power potential into spinning frames and cards by switching to individual motor drives.

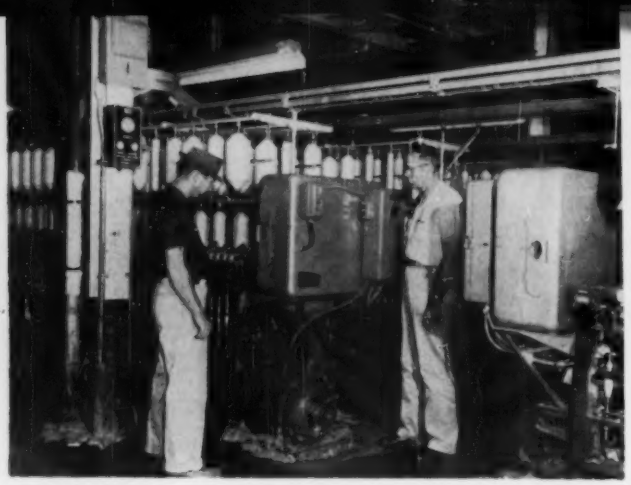
Canton's No. 2 Mill (which, like

NEW SYSTEM—Switchroom is bricked in, fireproof, and near center of the mill. Plant Engineer Holbrook and Master Mechanic Pettit look it over. They like it.

OLD SYSTEM — Interrupting-capacity rating had only a fraction of maximum requirements. A feeder-cable fault would have been disastrous.



OUTDOOR bus-bar duct is 4,000 amp., ventilated. From utility substation to new switchgear room (far right) is 125 feet. Building wall is 13 inches of brick.



MORE POWER—everywhere. At filling spinning, for example, 10-hp. motor provides adjustable-speed drive, collection for broken ends, and frame cleaner.

NEW POWER SYSTEM

. . . *Begins on page* 41

No. 1, makes blue-denim fabrics exclusively) was built in 1923. Through the years, the mill has grown. First new looms came in. Then new dyeing machines. Later, new compressors and compressive-shrinkage machines. A four-story addition was built in 1950 with 360 new looms, plus yarn-making units.

This constant adding of machines slowly outgrew switchgear capacity, and switchgear was badly overloaded with little or no interrupting capacity. In February 1958, the power demand finally outran the supply when 216 new 46-in., X-2 looms were added.

That's why Plant Engineer J. T. Holbrook sat down with a Westinghouse switchgear engineer. The men made a thorough study of the system and the mill. Their answers could be also the answers for other mills (including yours), because Canton No. 2 is a medium-size mill with 268 cards, 33,000 over-all spindles (90 warp frames and 50 filling frames), and 863 looms.

OLD SYSTEM—DANGER

One-third of the mill has four floors. The other two-thirds has only three. The mill is 800 feet long, 100 feet wide. Total floor space is 287,000 square feet.

The old system at Canton was 575-v., 3-phase, 60-cycle. It was fed from a power company 5,000-kva., 44-kv. to 600-v. transformer bank with 7% impedance.

Maximum demand of the mill was 3,660 kva. This left a margin of approximately 1,300 kva. for mill-load increase. The indoor 600-v. main distribution switchgear was 75 feet from the transformer bank and was fed by eight conductors per phase of underground cable. Two separate main feeders in the same switchgear room were fed from overhead cables. One circuit was two conductors per phase, the second was one conductor.

The indoor switchgear consisted of a main oil circuit-breaker switchgear with 10 oil circuit-breaker circuits: seven rated 500 amp., one 600 amp., one 800 amp., and one 1,200 amp.

The main feeder panel also had an oil circuit breaker. In addition, there was a wall-mounted air circuit breaker rated at 800 amp. The power company was delivering 43,000-amp. maximum fault current on its substation 600-v. bus, which was just a little more than could be obtained at the bus of the switchgear.

This fault current plus mill-motor feedback resulted in maximum interrupting-capacity requirements of the mill feeder breakers of 74,000 asymmetrical amperes (43,000 $\times$ 1.14 + 25,000).

The oil circuit breakers had interrupting-capacity ratings of 12,500 and 10,000 amp. for the two large breakers, less for small ones.

So the engineers reached these conclusions after seeing that the circuit breakers were inadquate: (1.) a feeder-cable fault close to the switch room would weld the oil circuit-breaker contacts closed, thereby blowing the power company primary fuses and shutting the mill down, or (2.) the oil circuit breakers would blow up when trying to clear the fault, thus would shut down the mill.

NEW SYSTEM—NEW POWER

So Canton immediately set out to avoid electrical disaster by installing a complete new electrical-distribution system.

The first step in the program was to build a new switchgear room. This building adjoins the mill machine shop and is 125 feet from the power-company substation. It's near the center of the mill.

The building is 32 feet long and 16 feet wide. Walls are solid brick 13 inches thick. Floors are a 10-in. poured-concrete slab. The roof is also poured slab 8 inches thick. Windows are glass block.

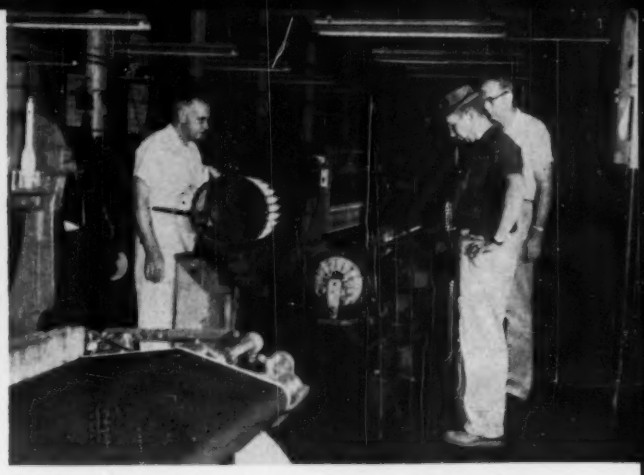
A convenient maintenance feature of this building is a pit under the switchgear. The pit is easily accessible from each end of the switchgear by merely lifting an iron grating. Distribution cables lead from the switchgear through this pit to all sections of the mill.

SWITCHGEAR ADVANCED

Heart of the system is an indoor metal-enclosed switchgear assembly for 600-v., three-phase, 60-cycle service. The switchgear controls and protects the following circuits: one 5,000-kva. incoming line (coming: 7,500 kva.) with two 4,000-amp. incoming line breakers, nine 600-amp. feeders, and three 800-amp. feeders.

The switchgear is unitized three-

NEW DRIVE for slasher has controls in a single factory-wired unit. One more reason Canton had to key up its power-distribution system.



BETTER WEAVING (with new X-2 looms) demands larger-horsepower motors and more power, plus larger clutch-brake motors, power transmitters.

position construction with three de-ion draw-out air circuit breakers per unit for feeders.

The de-ion incoming line breakers have an interrupting-capacity rating of 100,000 amp. at 600 v. Each breaker has dual magnetic overcurrent series trip devices (one per pole) for instantaneous tripping on fault currents above 40,000 amp. to provide cascade operation of the feeder breakers.

The de-ion feeder breakers have an interrupting capacity of 50,000 amp. at 600 v. Each feeder breaker has dual magnetic overcurrent series trip devices (one per pole) to provide time-delay tripping on overloads and instantaneous tripping on short circuits.

Right now the switchgear is being used as two individual sections with each section supplying power for half the mill. But if one section should be out of operation for any reason, the two sections can be quickly bridged together to keep the mill running.

CAPACITY TO SPARE

Three feeder breakers are not being used at present because they're not needed. And there's space at each end of the switchgear for three (total six) extra feeder breakers for future expansion.

Three new transformers for the lighting system are in an adjoining room. They are Type AVR 200-kva/1/60, 600-240/120-v.

With the installation of electrical equipment, the mill has completely rewired with 500-MCM wiring. The weave room, a typical mill department, is wired this way.

The 500 MCM goes from the switchgear breaker feeder through the pit to the basement under the weave room and to control stations in the weave room. Branch-circuit panels each serve 32 looms. Looms have individual motor starters. Wiring from the control stations to branch-circuit panels is No. 10. Then No. 12 wiring is run to each loom through conduits down each line of looms.

NEW MACHINE DRIVES

Most looms in the mill are Draper X-2 with only 40 E-model looms not individually driven. Motors are 1-hp. Diehl power transmitters and Westinghouse clutch-brake motors.

Spinning frames were changed from line shafting to individual-motor drives. Filling frames have 10-hp. motors, and warp frames have 15-hp. motors. Drives are Reeves adjustable-speed drives with Reliance motors. Two frames are supplied from each branch-circuit panel. No. 4 wire is used to the branch-circuit panel, and No. 8 is used from there to each spinning frame.

REASONS FOR MOTORS

Individual motors were installed for two reasons: (1) to cash in on the advantage of adjustable-speed drives, such as reduced losses of production at motor outages; (2) to permit installation of Collecto-Vac end-removal system and Parks-Cramer frame cleaners.

On a month-to-month basis, card drives are also being changed over from line-shaft drives to individual-motor drives. Early this year, 50 cards had been changed over, and all cards will be changed in Canton's long-range plan.

HOW DRIVES WORK

New drives are Gates Super-V with 1½-hp. high-torque motors. Each circuit panel serves 21 cards.

This card-drive change-over is being made for many reasons. Here are seven of the principal reasons that Canton decided to go ahead:

1. To maintain constant card speed.

2. To make drives easier to fix.

3. To cut lubrication.

4. To avoid dripping of oil on goods.

5. To add conveyors for laps (part of this system has already been installed).

6. To cut machine downtime (cards aren't all stopped at once at motor outages).

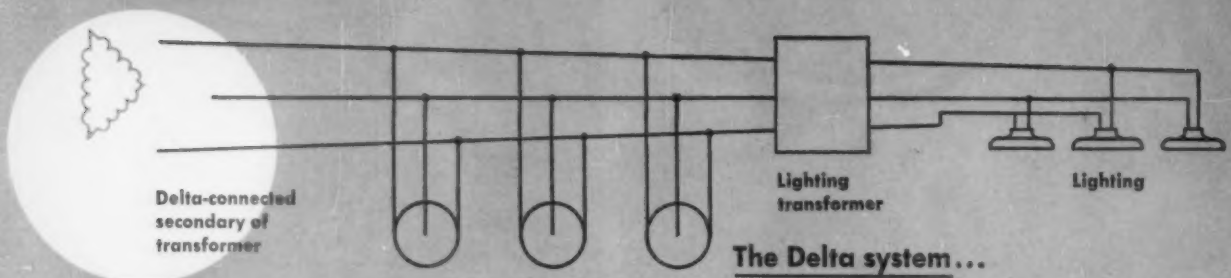
7. To improve general appearance of the whole room.

ADDING UP COSTS

All work in installing the electrical system, distribution system, and machine drives was done by Canton maintenance men. This way, costs of installation were kept within manageable bounds.

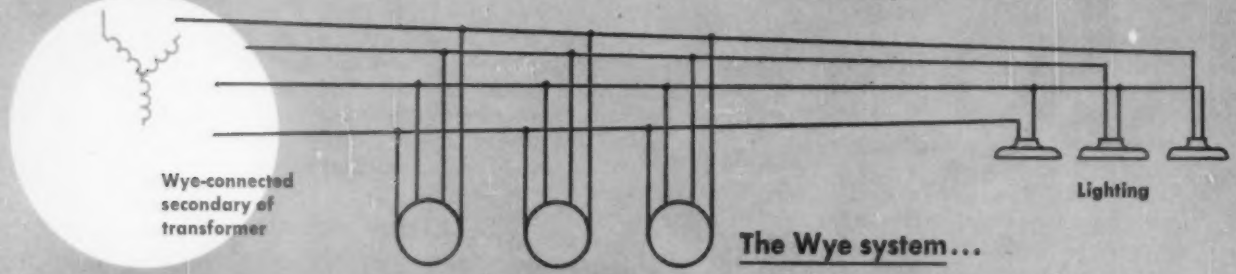
Here's how the cost of the new electrical system stacks up bit by bit: bus bars, 26% of the total; switchgear, 57%; electrical wiring and conduit, 9%; and switchgear room, 8%.

How Delta and Wye Systems Differ



The Delta system...

- Needs less conductor.
- Requires transformer for lighting.
- Permits continued operation (for a while) with fault on one phase.
- Does not require constant attendance.



The Wye system...

- Needs more conductor.
- Needs no transformer for lighting.
- Stops all equipment on a fuse when fault occurs.
- Requires constant attendance by trained people.

Big Decision: Delta or Wye?

The way you turn can make a difference in your mill profits. So listen while this Georgia plant engineer (who begs to remain nameless) states his side of this controversial question on textile-mill power.

WHAT'S the first decision you have to make in planning an electrical distribution system for a textile mill? What question is likely to touch off hot debates among managers and engineers?

That question is whether to use a Delta (600-volt ungrounded) system or a Wye (480/277-volt neutral grounded) system (diagram above).

This really is a key question. Fact is, it calls more for a management decision than for an engineering decision. Because the way the decision turns can affect many of your mill operations and can make a measurable difference in initial costs of the system, in payroll, and in mill profits. It's a decision that you must make in terms of the situation and the needs of your own mill.

Taking the simplest view, you'll see the merits of the two systems stacking up this way:

• On flexibility and expandability they're about even.

• On safety, the Delta system is theoretically safer, especially when it's new, since you can be grounded and touch a conductor without getting a shock. But when a system gets old, grounds occur oftener and the safety factor of the Delta system thus decreases.

• For lighting, the 600-v. Delta system requires separate transformers. With a 480/277-v. Wye system you can connect fluorescent lights directly to the neutral and any of

the three-phase conductors in the system.

• As for conductor (copper) required, the Delta system uses slightly less.

COMING TO DECISION

With these relative merits in mind, here are four major factors that you should weigh in deciding between a Delta and a Wye electrical-distribution system:

1. Utility policy on providing transformers. If the utility provides the transformer, you'll probably have to take the secondary voltage and the connection the utility offers. Not a very flexible arrangement, to say the least, but a fact of life. Some utilities, though, won't provide transformers except for the smallest plants (500 kva. and less). So you may have to buy your own transformers and purchase your electric power at high voltage.

2. Utility policy on secondary (low-side) metering. Usually the metering is done at the point where the utility's investment and its control stop. If the utility owns the transformers, metering will be done on the low side and you will pay rates that include the utility's amortization, installation, and maintenance costs. But if you own the transformer, the cost of investment, amortization, and maintenance will be yours. It's then a question of whether the somewhat higher rate you pay for low-side metering will be more than offset by your freedom from responsibility for maintaining the transformer and by your freedom to invest your capital funds in production equipment rather than electrical equipment.

3. Original cost, cost per kilowatt-hour, and amortized cost for the life of the equipment. If the utility will provide you with low-voltage power and if (by chance) it offers you a choice of Delta or Wye service, you'll have to spend a little more money for conductors for the Wye system. But if you use a Wye system, you won't have to invest in lighting-system transformers.

4. The number and skill of the people available to install, operate, troubleshoot, and maintain the electrical system.

RULE OF THUMB

Of all four factors above the last probably is most important. By and large it will tell you whether you should have a Wye system or a Delta system in your mill. In brief, the rule goes this way:

• If your mill is one of the fortunate few that have plenty of qualified people to take care of an electrical system, you probably should go for a Wye system—and shoot the works with high-voltage distribution and with unit substations spotted in strategic places throughout the whole mill.

• If your mill isn't that lucky—if it doesn't have plenty of skilled electrical people—you'll be better off to stick with a Delta system (provided your utility company makes it economically attractive).

For the average mill a 600-v. Delta system probably is best. Why? Because the average mill must operate at least one shift (and in some instances two shifts) without an electrician. This means that if there is a fault, one leg of the three-phase system can be grounded and your equipment can keep right on operating until the fault is found and cleared. Of course, if a ground occurs on another phase, then you may be in for more serious trouble, because two ground faults (if they're on different phases) can burn out adjacent motors without warning. So even on a Delta system you can't ignore a ground indefinitely. Eventually it will catch up with you.

As for the Wye system, one fault is enough to stop all the equipment on a given fuse until the electrician can locate and clear the fault. So the Wye system is costly. Without constant attendance (which costs money) it carries the threat of machine downtime and spoiled goods (which also cost money).

MORE DECISIONS

If most of the load in your mill is concentrated within 1,000 feet of the central substation site, and if demand is not over 1,000 kva., you probably should have just one substation. Metering should be on the low (or secondary) side.

The utility should provide this substation. Why? Because though power transformers are relatively troublefree, they do fail sometimes. If the one serving your plant should fail and if the utility owns it, the utility will bring in one of its own spares to keep your mill going. What's more, the utility will put its own men and equipment to work, thus get your mill back into production far faster than your own people could, even if you had a spare transformer of your own. That's because the utility is sure to have really professional men to handle trouble.

Suppose you decide to use just one central transformer (that is, the utility substation) and to install enough copper in the system so your line losses will be negligible. Would you come out better than if you spotted unit substations near load centers? It all depends on your own situation. It's possible that the high cost of your copper might well be more than offset by what you'd save in capital outlay for unit substations. If you were to put this capital into textile machinery, you might get a better return than from your investment in substations. Each mill is different. Each one will come up with a different analysis of present and long-term cost involving mill growth and the need for more power.

"MUSTS" FOR ALL

Even so—Delta or Wye system, central transformer or unit substations—there are some "musts" that every mill-management man ought to insist upon. Here they are:

• Drawout-type switchgear, with plenty of circuit-interrupting capacity at the main bus.

• Three-phase aerial cable for all outside circuits.

• Adequate magnetic air breakers at all distribution points in the mill.

• Protection for each motor by a combination line-starter in a NEMA 12 enclosure.

• Totally enclosed motors, fan-cooled, textile-type, with ball bearings and automatic grease purge.

• Adequate lighting, with quick- or instant-start fixtures. Lighting current supplied through dry-type transformers. Power for each department's lighting to come from the circuit serving that department.

Five Recent Textile-Mill Electrical Fires—

FIRE 1

Type of operation—Jacquard weave room running man-made-fiber yarns and cotton blends.

Loss from fire—$15,000, including water damage.

Cause of fire—Ballast of a fluorescent lighting fixture short-circuited above one loom.

Progress of fire—Sparks thrown from short circuit started a fire that spread to other looms.

Moral—Use fluorescent fixtures that have totally enclosed, nonventilated ballast housings. Ground all fixture enclosures.

FIRE 2

Type of operation—Sprinklered cotton warehouse.

Loss from fire—$10,000. Nearly 2,000 bales of cotton involved with fire or water damage.

Cause of fire—Electrically driven cotton stackers were supplied through heavy-duty flexible cables. A spliced cable broke adjacent to the splice. Resultant arcing from the cable ignited the baled cotton.

Moral—Keep a careful watch on your flexible cable. Replace that deteriorating insulation before a short circuit occurs.

FIRE 3

Type of operation—Manufacture of blended fabrics of man-made and natural fibers.

Loss from fire—$100,000.

Cause of fire—Electrical short circuit. Power was supplied directly from substation through magnetic contactor to 125 looms (individual motor drives). Circuit-breaker panel board was arranged as a "group fused" installation, which requires fuses of a certain size (National Electric Code). Wiring to each row of looms was in conduit. Conduit was run in a nonsprinklered crawl space. Taps to each loom on each line were made in T fittings too small for the splices. Covers for these fittings were left open, with splices hanging out. Short circuit was inevitable.

How to Ban Fires in Your Mill

THOSE FIVE stories at the top of this page are all true stories. They all had their origin in carelessness, in indifference, in ignorance, or in some failure to follow established safe practices. They are part of a shocking pattern of needless waste in the textile industry. For some companies, in fact, fires like these spell ruin.

Can't happen to you, you say? Don't be too sure. Almost any day now you could find yourself paying for a fire much like one of those five. What will spare you this pain? Three things will:

- Keep your mill's electrical system updated.
- Follow the guides setup for you by the National Electric Code (NEC) and the American Institute of Electrical Engineers (AIEE).
- Keep your eyes open and your brain working all the time to spot electrical hazards in the mill.

By SWAFFIELD COWAN
Electrical Engineer
Factory Insurance Association
Charlotte, N. C.

FIRES ARE BIG BUSINESS

Just how serious are electrical fires in the textile industry?

Factory Insurance Association recently made a study of fire claims filed by textile mills over a 7-year period in Virginia, North and South Carolina, and Georgia. In that period textile mills filed claims related to 4,410 fires. Of these 4,410 fires, 839 (or 19%) were known to be of electrical origin. These 839 fires accounted for 21.1% of the total dollar losses claimed. How much money is that? Close to $4-million—a tidy sum even when spread over seven years. And it doesn't take into account the loss of profits on goods that could not be produced because of these fires, or the loss of wages by employees who found themselves without places to work in.

Factory Insurance Association carried its study even further—broke down the claims it received by mill areas in which electrical fires occurred. What's more, it matched the seven-year study against an earlier four-year study (table, page 48) and came up with some significant observations and trends, as follows:

- Fires of known electrical origin account for about the same percentage of the total in both studies. This is a surprise. Considering the large increase in the number of motors, controls, and other electrical equipment in textile mills, you would expect the percentage of fires of known electrical origin to increase. You can credit the fact that it did not increase to several factors: (1) the increasing awareness of electrical hazards by equipment manufacturers, electrical engineers, contractors, and equipment users; (2) replacement of a good deal of old, obsolete, and dangerous equipment; and (3) the growing practice of preventive maintenance in textile mills.
- Picker and opener rooms, two of the most hazardous areas in a mill, have comparatively few electrical fires. Why? Because for some 20 years insurance organizations have pushed hard for better electrical installations in the preliminary-process areas — opener and

and What You Can Learn From Them

Crawl space was almost inaccessible. Weave-room floor was oil soaked on top, with tinder-dry heart pine underneath.

Progress of fire—When inevitable short circuit came, the insulation of the splices beneath one loom ignited. Pine underfloor then took fire. Contacts of the magnetic contactor welded, leaving only the small circuit breakers in the panelboard to clear succeeding faults that occurred as the fire spread.

Moral—Don't run wiring in a nonsprinkled area. Splice wiring carefully. Don't expose splices.

FIRE 4

Type of operation—Cotton mill.

Loss from fire—$1,250,000. Mill almost totally destroyed.

Cause of fire—Electrical. Exact cause unknown because of nearly complete destruction. Could have been a hot bearing, sparks from a motor failure, or a breakdown in wiring.

Progress of fire—Began in sprinklered basement room housing air compressors and related motors and controls. Spread swiftly to nonsprinklered crawl space beneath grade floor. Swept on through entire mill.

Moral—Watch crawl spaces. Fire could have been confined if crawl space had been sprinklered and cut off from other areas by fire-resistant walls.

FIRE 5

Type of operation—Twister room.

Loss from fire—Negligible damage to twisters. But smoke and water together caused loss of about $25,000.

Cause of fire—Lint on traveling cleaner was ignited by a spark from the contact conductors.

Moral—Use shielded conductors. Install such equipment by National Electric Code, Paragraph 503-13, and AIEE Recommended Practices for Electrical Installations on Textile Machinery.

picker rooms, waste houses, and raw-stock warehouses.

• The weave shed charges nearly 40% of its fires to electricity. That is probably because there are many individual machines (looms), each with its own motor and switch—not to mention the electric stop motion, which itself produces many fires.

• Dollar value of losses varies between the four-year and the seven-year studies. This probably can be charged to one or two large money losses, which could shift the percentages substantially.

• About 75% of the fires of known electrical origin are equally divided among motors, motor controls (including switches), and fixed wiring systems.

GETTING RID OF DANGER

Fire in a textile mill can be a disaster. Stock in process is highly combustible. Even more combustible is the "fly" that settles on machines, walls, floors, and even people. Any source of ignition therefore is a serious threat to safety and to investment.

What can you do to wipe out the threat—or trim it down to manageable size? To see, read on.

Interrupting capacity—Ten years ago you wouldn't have found a 1,500- to 2,500-kva. transformer bank anywhere except at a very large mill. Today, 3,000-kva. banks are commonplace. And the public utilities have beefed up their systems to provide the increased normal demands for power. This, of course, has increased the short-circuit power available to mills.

So it's time you took a new look at the short-circuit interrupting rating of your main switchgear. Maybe it was adequate 20 years ago—or even 10 years ago. That doesn't mean it's adequate today. It could be outmoded, obsolete, and even dangerous to people and property.

Granted, a change will cost money. Somebody doubtless will ask, "Why spend money to replace equipment that has never given trouble, seems to sit still and do nothing, and probably will never have to operate under overload?" The answer lies in the mechanization that has taken over many operations in your mill today. To mechanize your mill, you asked your electric utility to feed more power to your mill. The utility did so. Now it's up to you to provide the interrupting capacity your mechanized mill needs. Without it, you face the constant threat of electrical fire in your mill.

Emergency power—Ten years ago most mills used windows for ventilation. If there was any environmental control at all, it was humidity control. But today, air conditioning is essential to quality control. And because it's essential, it's commonplace.

So ask yourself a few questions: What happens when electric power goes out? What happens if there's a fire with a lot of smoke? Will the smoke go from the fire area into an area that otherwise would be unaffected and thus damage the stock? What about sparks? What about lint-collecting systems in which a lint-free air is returned to the air-conditioning system for recirculation? What about a fire in a monitor where there is an air return to the floor below and where the monitor is properly protected by sprinklers? Will severe water damage result? If fire breaks out, could you rely on the air-conditioning system to remove the smoke?

What you need, of course, is an emergency power supply—or at least an independent power circuit—for your air-conditioning system.

Lightning protection—Much of the textile industry is in a part of the country where electrical storms are frequent and severe. Fortunately today's lightning-protection equip-

HOW FIRE LOSSES ADD UP IN TEXTILE MILLS

(Virginia, North Carolina, South Carolina, Georgia)

Mill Area where fire occurred	Total fires from all causes		Percent of loss in area, from fires of known electrical origin (excluding lightning)			
			Based on Number		Based on Dollar Value	
	4-Yr. Study	7-Yr. Study	4-Yr. Study	7-Yr. Study	4-Yr. Study	7-Yr. Study
Picker room (mixing & blending)	669	1349	7.1%	7.4%	12.2%	14.0%
Weaving	336	678	38.1	38.5	61.4	55.6
Opener room	249	408	10.4	11.0	24.7	19.1
Spinning & twisting	241	418	26.9	30.4	28.5	30.8
Card room	173	304	19.6	21.2	36.8	35.4
Warehouses & storage	75	118	20.0	20.3	40.6	19.5
Waste house	74	115	12.2	9.6	5.8	4.9
Dryers	70	145	21.3	19.3	33.8	21.2
Spooling, winding, reeling	40	72	27.5	34.7	9.6	28.9
Nappers	24	37	58.3	54.1	44.8	22.2

Banning Fires in Your Mill . . . *begins on p. 46*

ment is far ahead of what was available 10 to 15 years ago. Most of the time it can divert lightning (or the induced voltages on the electrical system) safely.

Even so, today's equipment, good as it is, must be properly selected and installed. Grounds should be of very low resistance—not over 5 ohms. Grounds of the protective equipment should be interconnected with the grounds of the protected equipment.

Lightning takes the path of least resistance. Old, worn equipment, with its deteriorated insulation, offers just such a path. That's why it's important to keep track of the condition of electrical equipment. When they approach the end of their useful life, you should take them out of service for repair or replacement.

Power for five pumps—The automatic sprinkler system is the best answer to the threat of flash fire. Such a system usually has two supplies of water—an elevated tank or standpipe (maybe municipal), and a reservoir or ground-level tank with fire pump.

The fire pump these days is nearly always electrically driven. It starts up automatically in response to a drop in sprinkler-system pressure. (A small-capacity jockey pump maintains slight excess system pressure. This pressure drops quickly when even one sprinkler head opens, thus starts the fire pump.)

Power for the fire pump must be reliable. The circuit must supply the pump and nothing else (except directly associated equipment, of course). The circuit must be so set up that it will continue to supply power even if power is cut off from the mill feeders or switchboard. (See Pamphlet 20, "Standards for Installation of Centrifugal Fire Pumps," National Board of Fire Underwriters.)

Engineering—Many a mill manager these days, realizing his utter dependence on electric power and aware of the hazards inherent in electricity, employs electrical engineers to design and supervise installations and uses competent electricians to enhance the safety that is built into today's equipment. This procedure should be universal.

Safety additives—For example, NEMA (National Electrical Manufacturers Association) and AIEE have developed joint recommendations for an enclosure to house normally arcing or sparking parts in textile mills. It's called Type 12. Today it's widely used. Indeed, some mills have standardized on it.

In fact, the Textile Industry Subcommittee of AIEE a little over a year ago published (for trial and comment) "Recommended Practices for Electrical Installations on Textile Machinery." These proposed practices are designed to fill a big gap in the design and application of textile machinery. (To obtain a free copy, write to AIEE, 33 West 39th St., New York 18.)

THE INSURER'S VIEW

How does the insurance carrier look at these hazards? He takes them pretty seriously. And he points out that the remedies he suggests not only boost safety in the mill but are inherently related to reliability of operation in the mill and its equipment.

Here are some of the matters the insurer is interested in—and some of the remedies he suggests:

1. Transformer substation. Site

depends on three factors: good power distribution, the needs of the public utility, and the requirements of the insurance carrier. Important factors include exposure of buildings to a possible transformer fire; exposure of the transformer to a building fire; location of underground water lines, gas lines, sewers, and the like; and lightning protection, with the utility providing it on the primary and the mill on the secondary.

2. Secondary system. If lines from transformer bank to switchroom run overhead, lightning arrestors and surge-protection capacitors are usually needed at the main switchgear. An overhead static or ground wire may be justified on longer or severely exposed lines.

3. Fire-pump circuit. This circuit should supply only the fire-pump motor and its related equipment. Usually it should be connected on the supply side of the main mill disconnect switch. Controllers especially designed for fire-pump motors are essential. If transformer substation capacity is high, and if the pump is close to the substation, you may need some special arrangements if high short-circuit currents are available. If the fire-pump feeder is run overhead, you'll need lightning arrestors and surge-protection capacitors. Grounds should be interconnected to a common grounding electrode.

4. Well pumps. Often these are some distance from the mill, with power lines usually run overhead and thus exposed to lightning and lightning surges. Since the well pump itself usually is the best available, the driven grounds of the protection equipment should be interconnected with the grounds of the pump, its motor, and the well casing. Arrestors and surge-protection capacitors should be provided at each well pump and at the origin of its feeders.

5. Main switchroom and switchgear. A new switchroom should be planned for use of air-break, metal-clad switchgear, selected on a sound engineering basis and with an eye to the possibility of future mill expansion and future need for short-circuit protection. The room should be of noncombustible construction, thus eliminating need for sprinkling. The room should have inside and outside access by way of a standard fire door.

Adequate ventilation is a must. If there's a chance of condensation in winter or during shutdown, you should consider thermostatically controlled heaters. One more thing: If the openings are not tight, and if lint drifts into switchroom, better pressurize the room with clean outside air.

Older switchrooms often are built of combustible materials and house oil-filled switchgear. That's why they are usually sprinklered. If the old room is modernized, and if air-break switchgear is installed, you can sometimes remove the sprinklers and thus remove the danger of water damage if fire breaks out. On this matter, though, you should consult your insurer.

6. Ground fault indicators. The nominal 600-volt, 3-phase ungrounded system is conventional in textile mills. One of the advantages of the ungrounded system is that as long as it remains free of grounds, the accidental grounding of one phase doesn't produce an immediate short circuit, with danger of fire. To keep such a system free of grounds you should use a ground-fault indicator, with indicating lights at the main switchboard and at some other constantly attended location, such as the machine shop. These detectors usually are provided in new installations. Fact is, they're recommended by the 1959 NEC (250-5).

7. Interior wiring. Because goods in process and lint are combustible, wiring in most areas should comply with requirements for Class III, Div. 1, Hazardous Locations (NEC 503, 1959 edition). That is, rigid metal conduit, special construction for boxes and fittings, and enclosures for sparking parts.

You should provide for drainage, seals, and the like because condensation may be a factor when conduit is run from one area to another.

You must assure continuity of the grounding path. NEC recognizes the use of metal conduit. But NEC 502-16 (b) forbids dependence on locknut-bushing and double locknut types of contact. Instead, it requires bonding jumpers, or other approved devices. Good practice today is to run a continuous equipment-grounding conductor inside the conduit, with the circuit conductors. Unless it is bare, the covering of an equipment-grounding conductor must be green.

Wiring must not be run in crawl space beneath grade floors or in other vacant spaces unless such spaces are protected with sprinklers.

8. Enclosures. To keep lint out and sparks in, NEC (503-4) requires a special construction for the enclosures of motor controllers, switches, and the like. NEMA Type 12 usually meets these requirements. Types 1 and L-A do not—and should not—be used.

9. Motors. In textile mills the trend is toward totally enclosed, nonventilated and totally enclosed, nonventilated, fan-cooled types. But these latter need special construction to avoid clogging by lint. Both types are better than open motors.

A spark from a motor burnout has little chance to escape. And water (even water used in fighting a nearby fire) has little chance to get in and damage insulation. NEC 503-6 covers this point, as does AIEE's "Recommended Practices for Electrical Installations on Textile Machinery."

10. Lighting. For lighting warehouses, use incandescent lamps in a suitable gasketed fixture, with enclosing globe and metal guard to confine sparks and hot filaments if lamps break.

If you use fluorescent lamps, use totally enclosed, nonventilated ballast types. Where lint is a problem (picker, opener, or napper rooms) use a gasketed bottom plate.

Emergency lighting, especially in windowless mills, requires special arrangements—batter or engine-generator systems, automatic battery-operated floodlights, and similar systems.

11. Traveling trolley systems. Problems range from passage through firewalls to the need for ungrounded isolated systems with ground-fault alarm, to insulated or shielded trolley conductors. NEC 503-13 and Section 22 of AIEE's "Recommended Practices for Electric Installations on Textile Machinery" cover this ground thoroughly, and in such a way as to insure you against costly mistakes.

MANAGEMENT TEAM is compact. It's made up of William F. Wyatt, Sr., who's called W. Frank, and William, Jr. (Bill). W. Frank is the front office man; Bill, the production man.

How a Small Knitting Mill Makes Profit a Sure Thing

This father-and-son management team is making its own brand of history with aggressive investment in production, office space, and training. Today their outfit is counting big gains, planning for more.

A FATHER-and-son combination, operating their family-owned hosiery-knitting mill, has found an answer to the problem of sinking profits in a small mill.

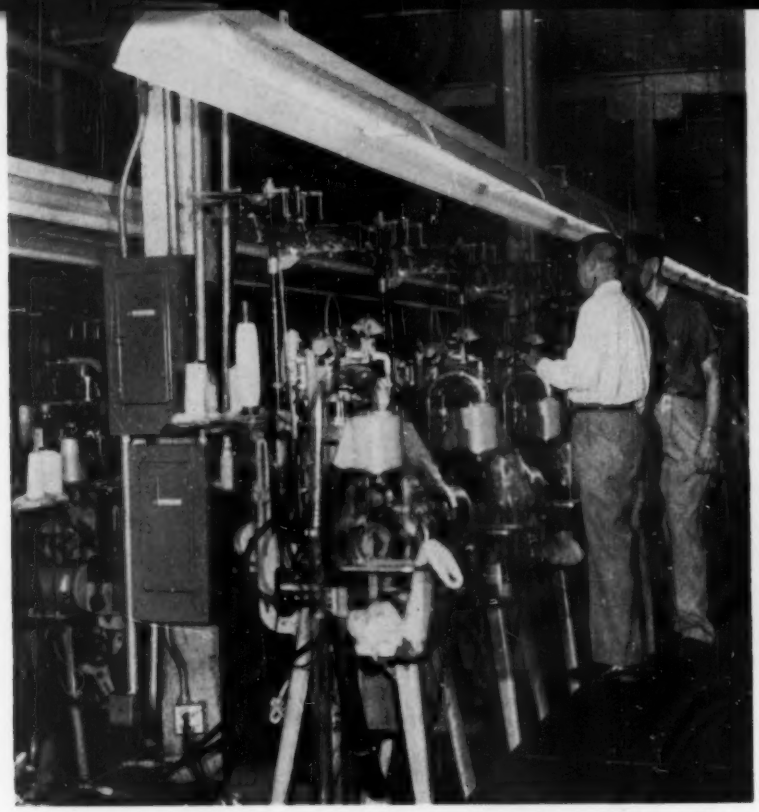
With some courageous and creative management most often seen in the highly-financed big companies, the William F. Wyatts (W. Frank, Sr., and Bill, Jr.) decided they had to keep their company on a competitive footing with the newest and best machinery. So they've invested $175,000 in 50 new seamless machines—the first installation of Reading-Booton equipment in America.

It was a big step. But the Wyatts knew they had to keep pace with changing demands if they wanted to maintain their profits. Like every other small hosiery mill they were faced with declining income from the competition of large corporations, brand-name selling, oversupply and—most of all—the decline of full-fashioned popularity.

OLD WAY: 8 MACHINES

Production before the big move at Wyatt Knitting Co., Inc. (Sanford, N. C.), was all on eight full-fashioned machines. These machines are still producing 2,000-dozen pairs per week. But the new equipment adds 1,400-dozen pairs of seamless per week.

The new Reading-Bootons owned by Bill under the company name, Beta Hosiery Co., and leased to



FIRST OF A KIND: This is first Reading-Booton seamless-hosiery machine installation in America. Young Wyatt manages production and quality control. Here Plant Superintendent Richard A. Stephenson confers with him.

OFFICE ADDITION is going to cost $7,500, add about 400 square feet of area. Once this addition is complete, old part of office will be remodeled.

the operating company, Wyatt Knitting Co. This $175,000 investment is no small venture for a young fellow, but Bill is working hard to make it pay off as it should. At the moment, he takes a full shift's turn at seamless-hosiery fixing while the regular fixer is at Textile Machine Works in Reading taking a six-week course in seamless-machine fixing. What's more, he's handling his usual job as production manager—a tough schedule even for a young man, but hard work and new machinery are an unbeatable profit combination.

Keeping the plant up-to-date in equipment is a regular practice at Wyatt. Three times in 20 years of operation the company has modernized its production facilities.

Production began early in 1940 in the 10,500-sq.-ft. building built by the people of Sanford. There were four German-made (Einsedel) full fashioned machines then, and business was good. Wyatt tried to buy four more, but the war canceled delivery and he had to settle for only two from Textile Machine Works. All these were short-section machines with hand welt turners. At the end of the war, however, W. Frank realized that they were being outdated by finer gage, long-section machines with automatic welt turners and other automatic features.

To keep pace he sold some of his old equipment to mills in Sweden, scrapped the rest, and invested in eight new machines—two 51-gage Readings and six 60-gage pieces. They're still in operation today, taking care of Wyatt's full-fashioned production.

Full-fashioned business was all that could be desired from the end of the war through 1954, so W. Frank decided to stick to that line when seamless hosiery began to gain in popularity in the middle 50's.

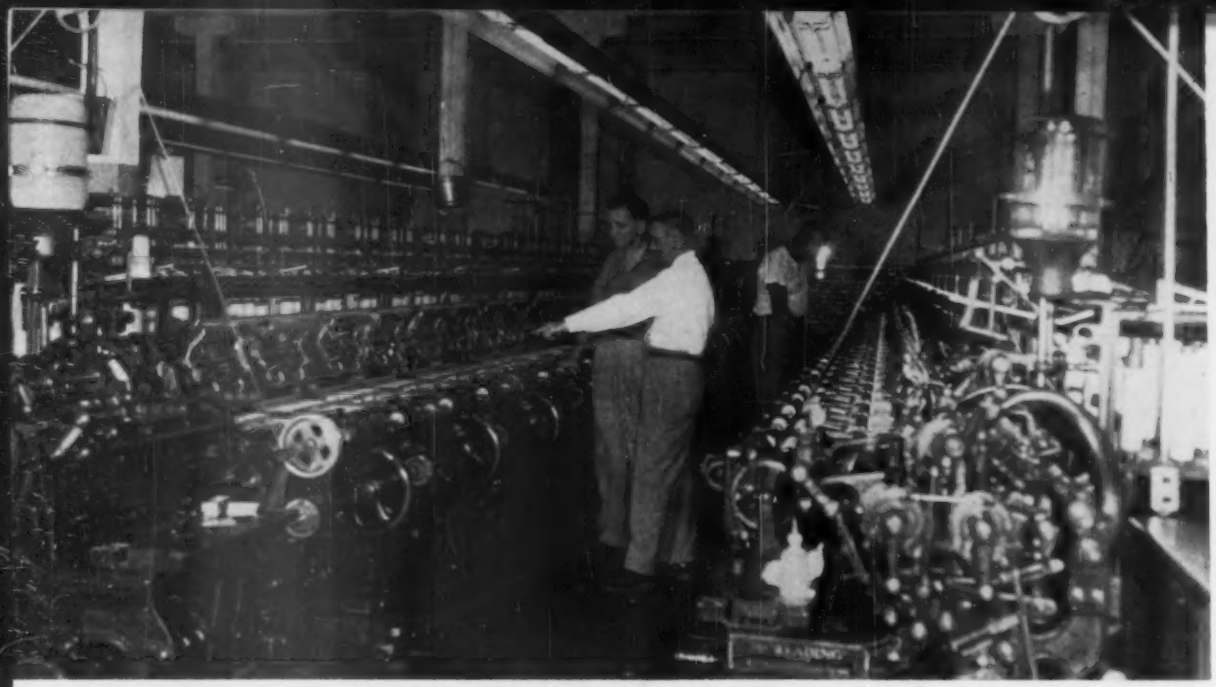
NOW—30 NEW MACHINES

By 1958 the competition from seamless had become so stiff that something had to be done. Wyatt made the decision. The company purchased thirty 480-needle seamless machines from W. E. Booton Ltd., an English manufacturer. Installation began in space left by machines that had been junked in 1945.

But before all machines were installed, Textile Machine Works entered a licensing agreement with Booton to build Reading-Booton machines in America (TEXTILE WORLD, June, 1959, p. 48; May, 1960, p. 260). Once again Wyatt decided to install another type of machine.

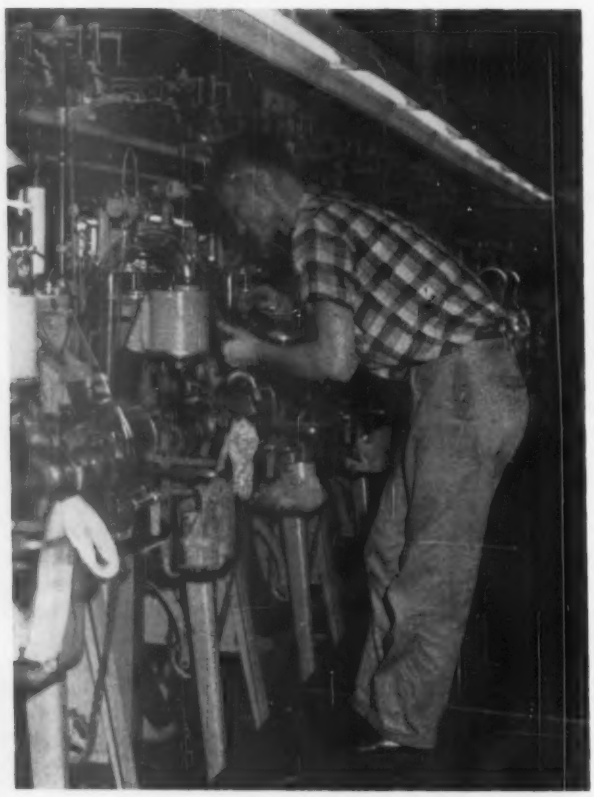
The Reading-Booton machines now in production are 400-needle, twin-feed machines with 3¾-in.-diameter cylinders. Machines run at 185 rpm., and production is 5-dozen pairs of hosiery every 24-hr. day per machine.

There are two feeds in the welt, afterwelt, leg, and foot, and a single



FULL-FASHIONED machines (Reading) still account for half of Wyatt's output. This 60-gage machine is producing stockings in 8½ through 11½ extra-long sizes, using 15 for 30-den. nylon yarn.

SMALL KNITTING MILL . . . *Begins on page* 50



MACHINE FIXER, fully trained to work on intricate seamless equipment, spent six weeks at Reading learning how to fix machines. While fixers are in training, Bill Wyatt fills in.

feed in the heel and toe. Six yarn fingers are on the main feed, and three fingers are on the auxiliary feed.

Standard features are warning light signals, electric stop motion, delayed looping course, slow-down for yarn changes, and cut-off switch at the end of a cycle.

The vacuum take-down is automatic. It controls the stockings throughout knitting. An additional graduating attachment insures uniform stitch control to form consistent loop lengths in all areas of the stocking.

Lubrication to all moving machine parts is automatic from a reservoir. Automatic trimming of ends from ¼- to ⅜-in. over-all length is another feature.

Present seamless hosiery is made from 15-den. yarns in the leg and 40-den. in the welt, heel and toe, with closure by the sewn-toe method. Sizes are 9 through 11½.

Seventeen employees were added to handle the seamless equipment, but training them was a big problem. A staggered delivery plan helped, enabling a learner to work with experienced fixers and knitters who had worked on the Booton machine in England. As machines were

SEAMLESS SEAMING is done by the Getaz sewn-toe method. Connecting threads on hosiery are cut, loose ends are removed by vacuum. Operator marks seam location with fugitive tint using a template.

INSPECTION is highly automatic. This station handles seamless hosiery. Two others handle full-fashioned inspection. Production per machine on seamless is 90 to 100 dozen per 8 hours.

MENDER-LEARNER (left) gets instructions from older mender. There are complete facilities manned by two skilled menders to repair both seamless and full-fashioned hosiery.

added, the learners took them over. Now, at full production, there are two knitters and two fixers on each of the three shifts. They handle 25 machines apiece.

TRAINING FIXERS

Every fixer has spent six weeks in training at Textile Machine Works' Reading plant. Under this training scheme the learners reach full production in three months.

Meanwhile, maintenance and operating procedures on the full-fashioned machines continue in an established pattern. Two sizes of yarn are used in the leg: 15 denier and 30 denier. Welt yarns for both of these leg yarns are 40 denier. Splicing yarn is 30 denier on both. Superintendent Dick Stephenson and one other man, on an 11:30 a.m. to 8 p.m. schedule, handle the fixing, while four knitters handle two machines apiece on each shift.

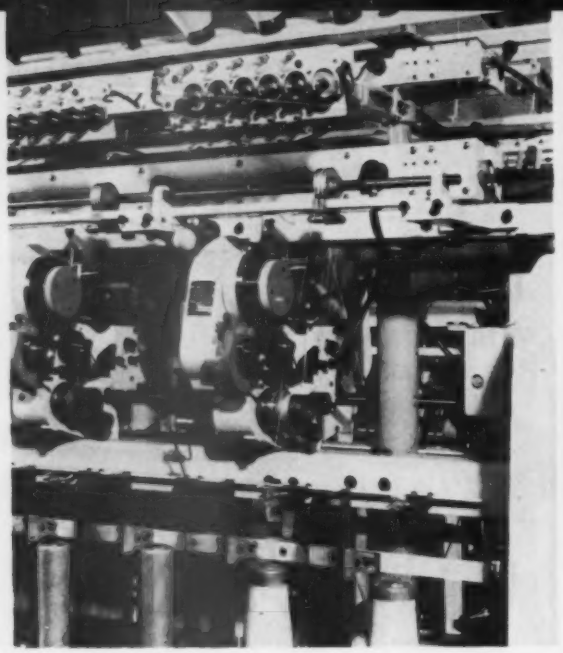
Inspection of the two types of hosiery is kept separate, but Inspectormatic machines (made by Specialty Mfg. and Sales Co.) are used on both.

A quick and efficient selling technique is one element in the profitability of the Wyatt Knitting Co. W. Frank handles all selling, direct from the mill through selling agents. It's fast and constant. It has to be, because at Wyatt there's no shipping department and almost no storage area for knitted stockings. The shipping clerk gets his stock directly from the inspecting machines. Hosiery is sold both finished and unfinished. The finishing is done by outside companies.

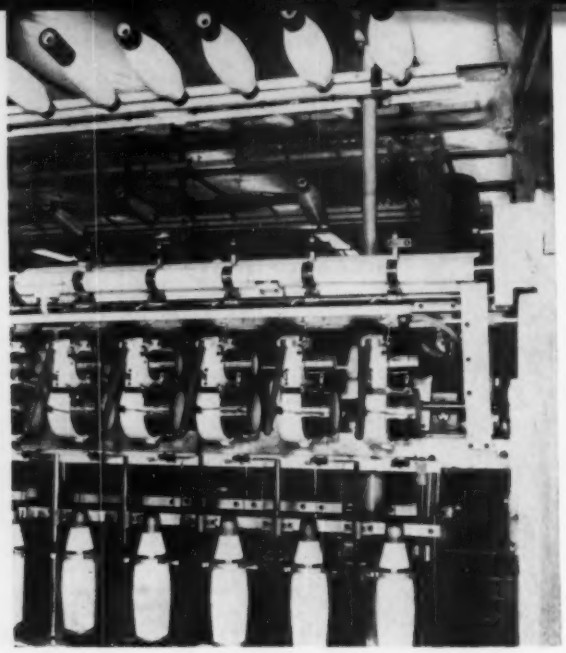
COMING: MORE EXPANSION

New machinery is paying off for the Wyatts. So much so that in spite of the large investment, they've decided to put another $7,500 into an expansion of their office facilities. A 16x24 addition is almost finished now, and the old offices are being remodeled.

Instead of being frightened by their deteriorating profit situation, this management team decided to attack it. It first recognized a changing demand, then bought the newest and best machinery to satisfy it. Next, the team gave employees the finest possible training on the new equipment — expensive now, but profitable over the long run. Finally, the Wyatts pitched in with hard work, getting out of their executive chairs when necessary to take turns in the plant.



TEXTURING on the 2110 machine: It involves multifiber thread-up, magnetic tensioner, oiling attachment, and double-taper build. Rolls are heated electrically.



HEATING the rolls on the 2086 machine: It is result of pumping a hot liquid through concentric pipes. Machine excels at texturing monofilament and multifilament nylon and Dacron.

Latest Word in Texturing—

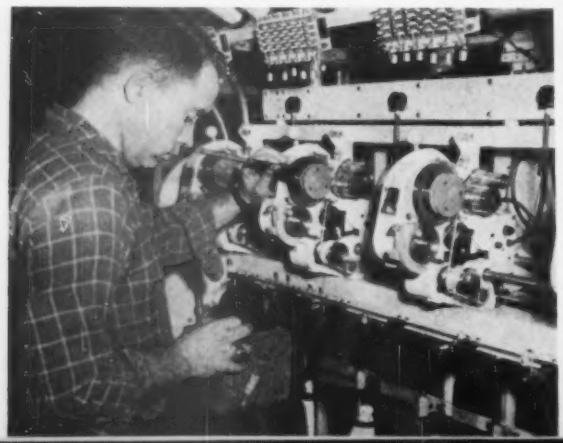
Agilon® Edge-Crimped Yarn

Commercial production of AGILON is off to a good start. Now, here's news on this promising new yarn—what the yarn is like, how texturing machines work, and how the biggest licensee fares.

NEWEST THING in textured yarns is AGILON edge-crimped yarn. It comes in either high-bulk or stretch form. It's made on machines developed by Deering Milliken Research Corp. and manufactured by Hobourn Aero Components Ltd., Rochester, England (photos).

In yarn form, the fiber has a low degree of bulk and handles much like filament. Under tension it looks like filament. This characteristic gives it additional strength and resistance to pilling and broken fila-

MEASURING temperature: Quality-control man uses a thermocouple wire holder and potentiometer. Only authorized quality-control and supervisors may make this test.



INSURING tension: Tensitron plays key role. Here Superintendent T. B. Davenport and Quality Control Chief James Lewis inspect a 2086 machine for tension variation.

ments during manufacturing. At finishing, however, the yarn develops a high degree of bulk or volume per unit weight.

Other characteristics of the finished yarn include a high degree of uniformity, softness, and loft. Dyeing is easy. Any dye that can be used on nylon can be used on AGILON yarn to produce bright, deep colors with good levelness. Another important feature: After 50 machine washings, tests show less than 4% reduction in stretchability of the yarn.

All of these properties promise to make the yarn especially suitable for use in stretch hosiery, socks, dress and suiting goods, sport shirts, tricot fabrics, lingerie, and foundation garments. In fact, with the yarn's stretch characteristics a mill can cover women's hosiery requirements 100% with three basic sizes. For men's socks, only one size.

License to operate the edge-crimping process has been granted by Deering Milliken Research Corp. to throwsters in the United States and foreign countries. Royalty payment amounts to 4% of the raw-material cost at current U.S. prices for all deniers above 17. Royalties are $2 per pound for 14 to 17-den. nylon and $3 per pound for 7 to 13-den. nylon. Approximate costs of the machines F.O.B. England are: Model 2110 — $21,000; Model 2086 — $15,000.

"BENDING" THE YARN

Two production machines, Models 2110 and 2086, are available for manufacturing edge-crimped yarn. These 100-spindle machines have a different approach to the production of textured yarn from other machines designed for the job.

The big difference is that yarn manufacture is a single-step process that starts with the manufacturer's package of nylon, Dacron, or other thermoplastic filament and ends with a delivery package of plied textured yarn—oiled and ready for shipment. Most other systems require at least three operations—texturing, plying, and coning.

A second difference is the method of crimping. Both the 2110 and 2086 machines bend the yarn over a blade. The hot yarn is bent so that one side shrinks more than the other, producing a curl.

The 2110 machine is designed to process 20 to 200-denier multifilament high-bulk yarn in a single end. Up to six ends of yarn can be plied so long as the total weight does not exceed 600 deniers. In other words, you can ply six ends of 100-denier yarn but only three ends of 200-denier yarn.

High-stretch yarn is made on the 2086 machine, designed to texture 10-denier monofilament through 100-denier multifilament nylon and Dacron. Today the machine is used chiefly to texture 15-denier 3-filament and 15-denier monofilament yarn for women's hosiery.

One of the advantages claimed for both stretch and bulk yarns is that no torque is introduced. This is important at knitting, especially on single-feed seamless hosiery machines. Other stretch yarns have to be balanced by plying S and Z twists before they can be knitted on single-feed machinery.

HOW THE 2110 WORKS

The 2110 machine, designed for the production of medium-denier bulk yarn, actually is an attachment for use with the Universal 10B twister, or it can be a complete machine in itself. If desired, the machine can be used as a down-twister.

The sequence of operation:

1. *Yarn is pulled* from draw-winder tubes or pirns in the creel through a magnetic tension control (replacing gate tensioners in earlier models) into the input feed roll.

2. *Yarn passes* around a grooved rotating electrically heated roll that raises yarn temperature to an average level of 365 F. Heat can be controlled to ± 5 F.

3. *Heated yarn passes* over the blade, where it is sharply bent, onto an unheated tension-compensating control roll, then to an intermediate feed roll. Here nylon shrinks 6.9% and Dacron stretches 11%.

4. *Yarn goes* back to the heater, where it is overfed 20 to 25%.

5. *Yarn moves* to output roll and to oil roll.

The usual shipping package is a 2¼-lb. knotless tube, but a 2¾-lb. package can be made. Reason for the smaller package is that it contains the same amount of yarn as the supply package and no knots are necessary. Shape of the package is double taper with a wandering-stroke wind on a tube.

Production is determined by speed of the texturing unit and type and size of filament. Spindle speed is determined by texturing speed. Three-ply, 100-denier yarn is textured at 52 yards per minute. At 80% efficiency one unit will produce 2,800 pounds net in a 168-hr. week. Two-ply, 70-denier nylon is run at 60 yards per minute At this speed, 1,500 pounds net is produced in 168 hours.

Feeding two spindles—Each texturing unit normally feeds two spindles and can handle from two to six ends. For example, in making two-ply or four-ply 70-denier yarn, four 70-denier ends are run simultaneously. In making three-ply or six-ply 70-denier yarn it's possible to run six ends of 70-denier—a poundage increase of 50%. For four-ply yarn, only one spindle is used because of limited space on the heater. Yet the same weight is produced as on two spindles of two-ply yarn.

For success with this AGILON edge-crimped yarn, room temperature should be kept at a constant year-round level with maximum variation of ± 2 F. There should be no free moisture in the air, and relative humidity should be from 45 to 55% at frame creel level. The room should be free of draft and the atmosphere free of lint and dust.

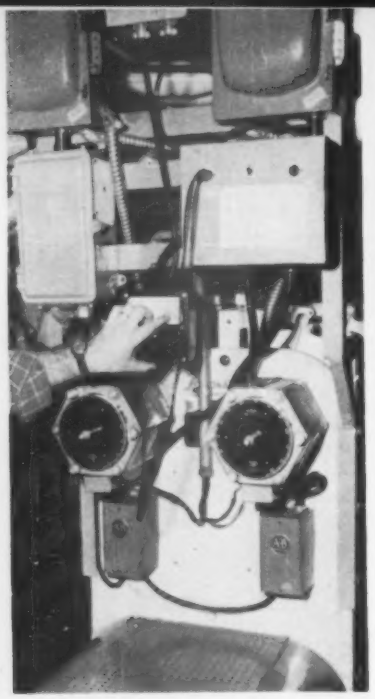
HOW THE 2086 WORKS

The 2086 machine is similar to the 2110 machine in that the yarn is heated and bent over a blade and no torque is added. But a rotating liquid-heated roll is used instead of an electrically heated roll. The yarn passes over the heated roll only once. Production of 15-denier single yarn is 360 to 400 pounds per week at 90% efficiency.

Sequence of operations:

1. *Yarn goes* from creel to input feed roll and onto the hot rotating roll, where it is heated to a typical temperature of 344 F. and controlled to ± 1 F.

2. *Yarn then passes* over the blade, where it is bent at a sharp



CHECKING controls: Voltage meter does this job. Voltage must be regulated at all times because it has a direct effect on machine's heater rolls.

EDGE-CRIMPED YARN

. . . *Begins on page* 54

angle and crimping takes place.

3. *Yarn next passes* over an unheated tension-control roll and then to the oil roll.

4. *Yarn moves* to output roll, then to spindle. Take-up package is a tall cone. Typical weight is 10 ounces for 15-den. yarn.

In running the Model 2086 machine, it's best to observe normal safety practices associated with any normal downtwister—plus these special points:

Cool heating tank on the end of the machine below 140 F. when the system is drained or opened. Don't let fluid exceed 425 F. on the double indicating thermometer. Use caution in working around hot and cold rolls to prevent entangling objects in these rolls. Stop the frame to adjust the tilt of the idler speed roll or to perform other work on the feed-roll drive system.

Processing the yarn—Mayco, Inc., Marietta, S. C., was the first and is biggest producer of AGILON yarn under the Deering Milliken license. The company now has 17 of the 2110 machines and 4 of the 2086 machines. The 2110's are running 12 types of yarn, from 20 to 200-denier filament. The other machines are on 15-denier, 1- and 3-filament yarn.

Mayco takes supervision seriously. In addition to the plant manager, superintendent, quality-control chief, and product development manager, there are two supervisors (called department heads) who take direct charge of yarn texturing. One is in charge of fine-denier yarn production, the other looks after medium numbers.

"Quality is our most important product, and close control is absolutely essential," says Superintendent T. B. Davenport. The mill follows the Deering Milliken Research operating manuals pretty closely as to operators' duties, maintenance, quality-control checks, and speeds. Machine efficiency is about 90%—higher than average.

TRAINING WORKERS

Important item in Mayco's operation: selecting and training operators. It's essential they be above average in intelligence and have a dextrous hand movement. Preference goes to right-handed operators with good eyesight who are over 5 feet 6 inches in height.

Training is carried on at the machine under the guidance of an experienced girl. On the first day the trainee does nothing but thread and rethread one spindle. Once she has mastered this technique, she gets more spindles to thread, and she learns the basic points of inspection. Duties are gradually added until at the end of four to six weeks, she can handle a full assignment of 300 or more spindles, depending on the yarn being run. There are 100 spindles to each machine. The job is made easier by posting a checklist of operator duties at the head of each machine.

OPERATORS' DUTIES

Here's a general listing of Mayco operators' duties:

1. Creel, thread up, and doff.
2. Clean on schedule, and make these scheduled inspections: doff and start-up, patrol, and shift check.
3. Patrol frame, repair breaks.
4. Report mechanical failure to maintenance man or supervisor.
5. Be responsible for yarn quality and other assigned duties.

More specific duties:

1. In doffing, check for creel runouts and singlings.
2. Place doffed bobbins on yarn truck in proper sequence to preserve identity, and label yarn truck with frame number.
3. Remove and dispose of empty creel packages; clean frame.
4. Inspect each yarn package for dirt and bruises. Remove transfer tail tapes.
5. Remove old blade from each unit, wipe holder, insert new blade.
6. Clean all guides with cloth.
7. Thread unit as directed, and inspect each bobbin of doffed yarn for dirt, oil, or grease; loopy filaments; broken filaments; and inadequately crimped yarn.

Room conditions for the 2086 machine are the same as for the 2110 machine, and general duties performed by the frame operator are quite similar. However, in restarting after each doff the operator of the 2086 should:

1. Remove empty creel package (if required) and place it on truck.
2. Wipe all guides with cotton cord, clean cloth, or brush. (Cleaning should start at creel and end on spindle-centering eye guide. Remove waste from spindle and adaptor.)
3. Wipe oil accumulations off feed rolls and cold roll.
4. Remove blade, replace traveler, and wipe ring with dry cloth.
5. Wipe rings lightly with cloth saturated in ring oil.
6. Remove lap-ups from rolls.
7. Install new creel package.
8. Install new blade carefully.

QUALITY CONTROLLED

Quality control checks are vital in the production of AGILON edge-crimped yarn.

The routine for checking at Mayco consists of skein tests at every start-up, yarn oil tests once a week or each time a number is changed, uniformity tests with a Uster Spectrograph, and a final yarn-appearance and weight inspection.

Other tests include laboratory checks on coil diameters, shape of yarn cross sections, tenacity, elongation, and twist, plus careful checks on voltage, humidity, temperature, and blade wear.

Fiber and spinning properties of the 1960 crop are generally superior to last year's. Improvements: grade, break factor, strength, yarn appearance.

How Central Belt Cotton Crop Shapes Up

Properties	Season 1955	1956	1957	1958	1959	1960
Grade index and designation	101 (M)	101 (M)	98 (M)	96 (SLM)	99 (M)	100 (M)
Staple length (32nds inch)	34.2	34.0	34.5	34.2	33.9	33.6
Digital Fibrograph (%)	—	—	—	—	—	9
Micronaire value	4.4	4.3	4.6	4.4	4.5	4.8
Maturity (%)	78	78	79	78	80	81
Tensile strength (1,000 psi.)	80	83	76	78	78	83
Manufacturing waste (%)	8.5 (M)	8.0 (M)	8.1 (M)	8.0 (M)	7.4 (SM)	6.5 (SM)
Neps (per 100 sq. inches of card web)	11	12	12	15	11	11
Average break factor	2,370	2,360	2,200	2,150	2,170	2,200
Yarn-appearance index	104	103	101	95	100	106

Central Belt's Crop: Better

MAJOR FIBER and spinning qualities of early-season Central Belt cotton are as good or better than last year's crop.

Grades for all five Delta areas average Middling. Staple length is slightly off in west Tennessee, east Arkansas, and northeast Louisiana, where droughts were severe during the boll-development period. Fibers shorter than one-half inch average 9%, measured by the Digital Fibrograph instrument. This is considered good.

Micronaire values this year indicate slightly coarser fibers than were seen in the previous five years. Missouri cotton was found to be finer fibered than cotton produced in the other Central Belt states, possibly because of the high proportion of a fine-fiber variety that growers are planting in the area.

The coarser fibers have high fiber-maturity values. Fiber tensile strength (Pressley) is, for the most part, the highest on record for the Mississippi Delta, northeast Louisiana, and Tennessee. The respective averages for early-season cotton in these areas are 85,000, 84,000 and 83,000 psi. Unusually hot and dry weather during the boll-development period was largely responsible for the high values. The previous three-year averages for Central Belt early-harvested cotton were 80,000 psi. or less. East Arkansas and southeast Missouri each had an early-season value of 82,000 psi.—higher than any year since 1956.

All areas made a record for low manufacturing waste. Even though the cotton averages Middling, the waste index is equivalent to the index normally associated with Good Middling cotton. This condition is due in good measure to the two or more stages of improved lint cleaners that nearly 40% of the Mid-South ginners are now using. During the six-year period, 1955 to 1960, manufacturing waste for early-season Mid-South cotton has shown a consistent downward trend from 8.5% in 1955 to 6.5% in 1960. The 8.0 and 8.5 percentages are usually associated with cotton grading Middling.

Missouri has the highest average break factor of any area—2,318. Next is Mississippi Delta with 2,225. The high break factor in Missouri is related to the finer cotton produced there.

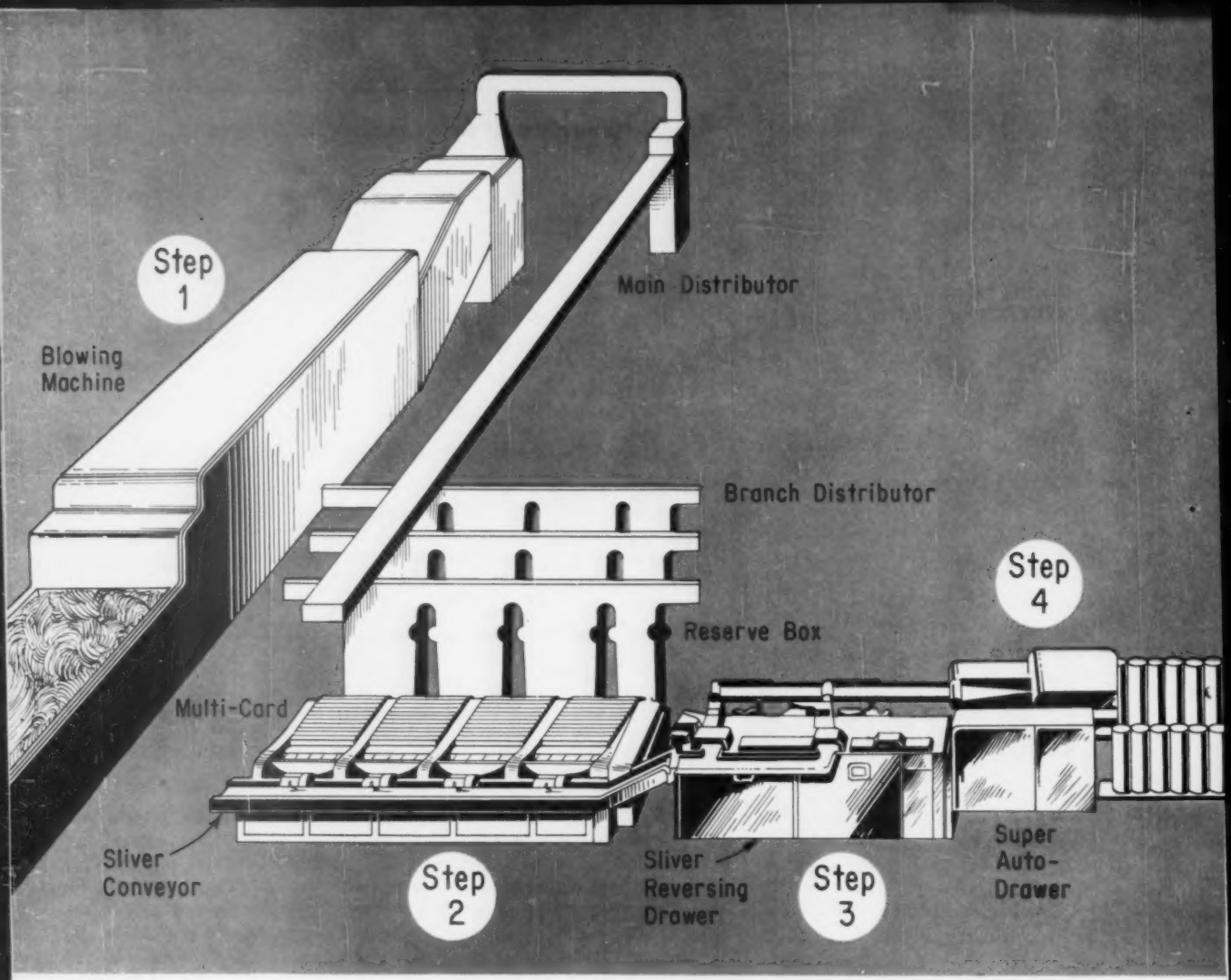
For the Mid-South area as a whole, nep counts are low, especially in the Mississippi Delta and northeast Louisiana. This is reflected in 1960's improved yarn-appearance grades.

Crops are being ginned according to prescribed lint-cleaning procedures. So far, the producers and mill buyers are finding this a profitable arrangement that assures maximum bale value to producers and improved spinning quality to spinners.

About 40,000 to 50,000 bales of cotton will be ginned according to recommended procedure in the Central Belt in 1960. This is an experiment, but it may yield basic evidence for a new concept of marketing.

Since the early-season lots were tested, there has been considerable rainy weather throughout the Central Belt. This may have an adverse effect on the quality of later ginnings. Nevertheless, cotton mechanically harvested in the area (about 60%) should yield nice-style Strict Low Middling and Strict Low Middling plus some Middling.

By F. L. GERDES,
Cotton Technologist, Retired
United States Department of Agriculture
Leland, Miss.



Highly mechanized spinning system integrates seven processing

Now: a Brand-New High

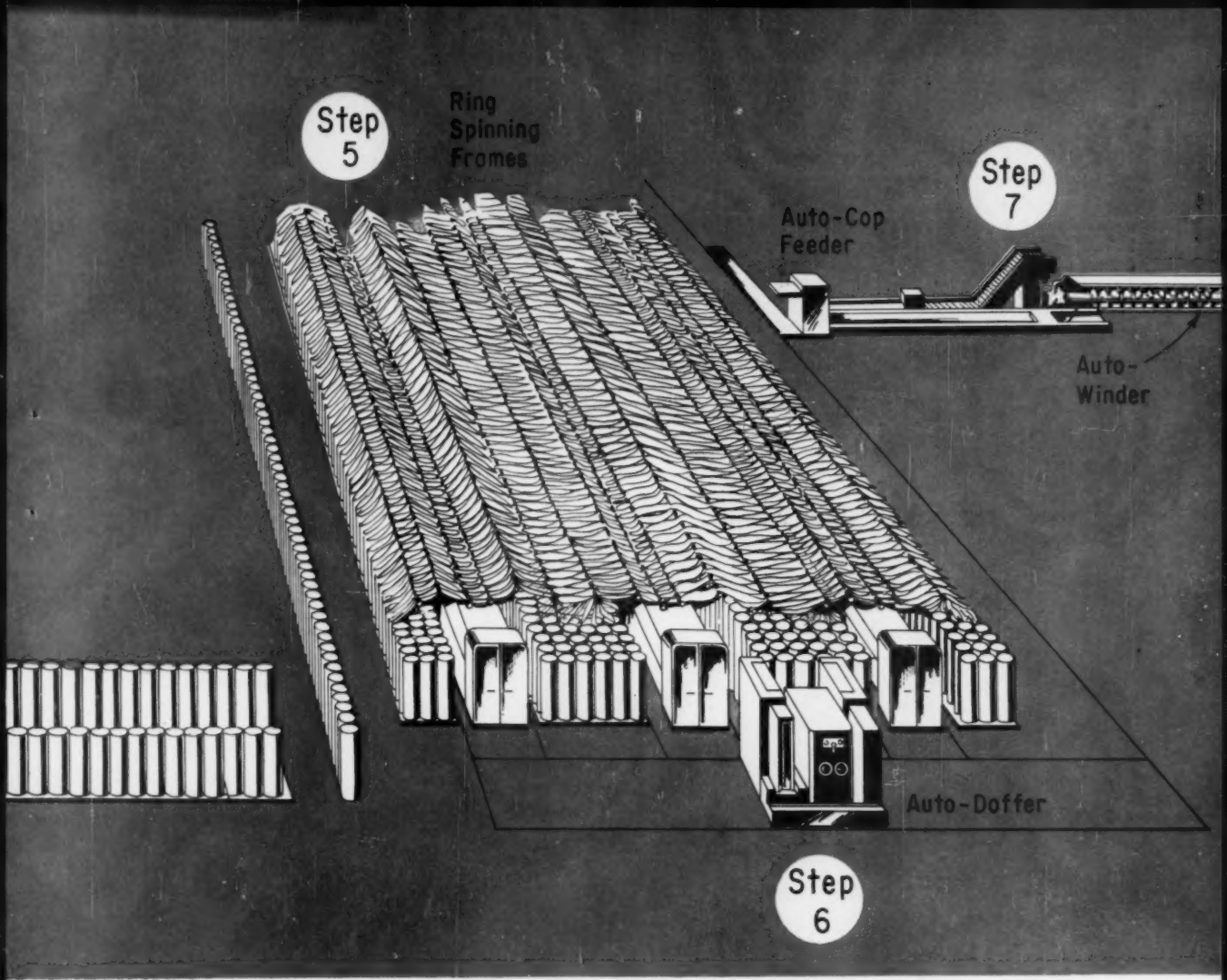
Direct from Japan . . .

. . . comes this report on a continuous, highly mechanized spinning system that's working today, on a prototype basis, in a Japanese mill.

The author of this report is an American textile engineer—an acknowledged leader in his profession and an articulate spokesman. He recently returned from an extended visit to Japan. Here, in these pages, he reports what the maker of this Japanese equipment told him about this brand-new system. He also reports (page 62) the results of his own laboratory tests on yarn made by the system.

Assuming that the data the Japanese gave our author are objective and complete, this system marks a significant step in the continuing mechanization of textile manufacturing.

Meanwhile, here in the United States, rumors of developments soon to come are beginning to take firmer shape. For instance, Deering Milliken now confirms reports that it soon will build a completely automatic spinning mill in South Carolina. And a leading American textile-machinery manufacturer is reported to be nearing announcement of its own continuous, automatic system. All this could be the start of a series of dramatic developments for mechanized spinning systems.



steps into one straight-line operation.

in Mechanized Spinning

THAT DIAGRAM above may well be a blueprint for spinning mills in the future. The installation is in the Jutami plant of Toyo Spinning Co., in Japan. It's a prototype continuous spinning system with elements of automation. With it, five operators tend a 6,000-spindle mill from opening through winding. Yarn quality is equal, Toyo says, to that of conventionally spun yarns.

1. OPENING

Cotton feeds to opening and picking equipment that is much like conventional equipment — except that the picker does not produce a lap. Instead, loose, opened cotton moves by air to a series of automatically controlled rake distributors that place it in a series of chutes above the feed apron of the cards. Rollers in the lower end of the chutes lightly compress the loose cotton into "lap" form.

2. CARDING

From three to five cards are grouped into multicylinder cards, with their cylinder shafts connected by means of flexible couplings. This way, operators can take a card out of operation whenever they must for one reason or another. In the system now installed there are two sets of these multiple cards. Each card produces anywhere from 6 to 10 pounds of sliver per hour.

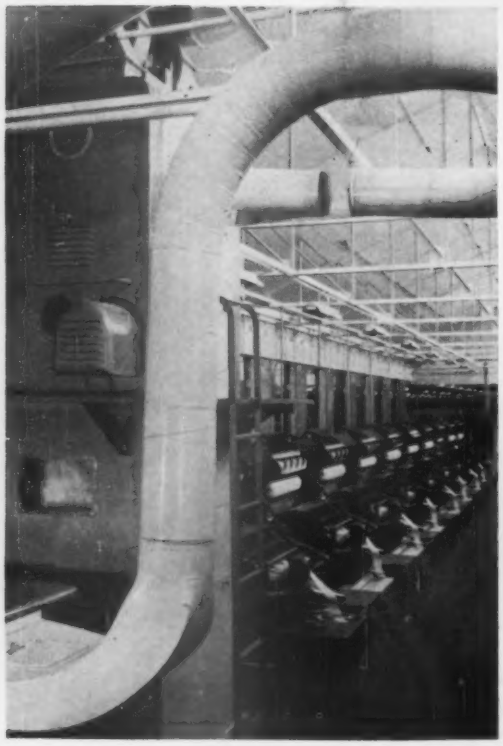
The company has equipped each card with the Toyo Carding Analyzer. This is a perforated roll that is covered with metallic card clothing. This roll is beneath the lickerin of the card. The clothing removes short fiber, motes, and dust.

3, 4. DRAWING

Sliver feeds from each card (in a flat-ribbon form) to a conveyor belt resembling the old railway head. Three to five card slivers go to each

Step 1

RAW COTTON feeds to opening and cleaning equipment, which is more or less conventional except that no lap is formed by a picker.



Step 2

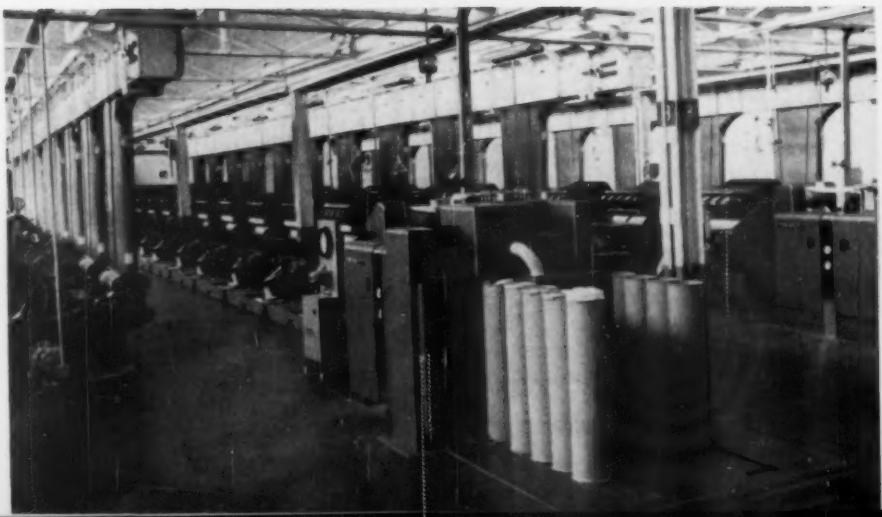
OPENED FIBER moves by rake conveyors to chutes located above the feed apron of the cards. Feed to cards is by gravity.

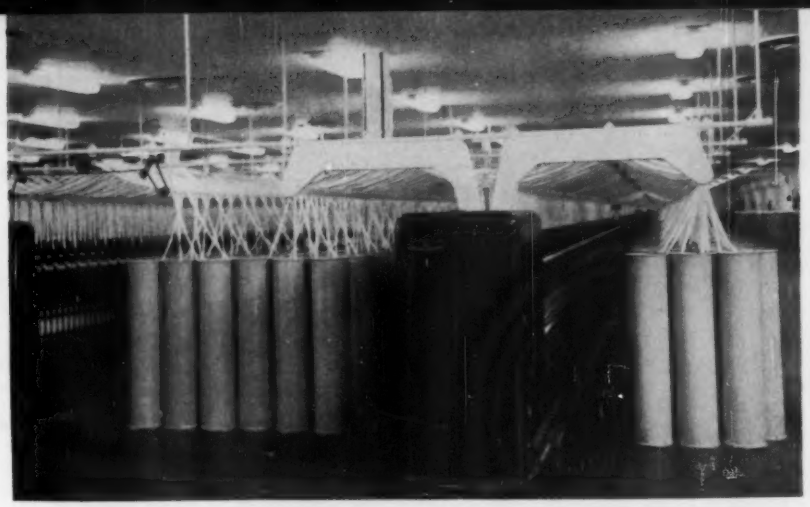
Step 3

SLIVER is delivered by conveyor to first drawing. Drawn sliver is reversed on being fed to second drawing.

Step 4

SECOND DRAWING of ten slivers performs automatic evening between drafting rolls. Pneumatic servomechanism, governed by weight of in-going sliver, controls roll speed.





Step 5

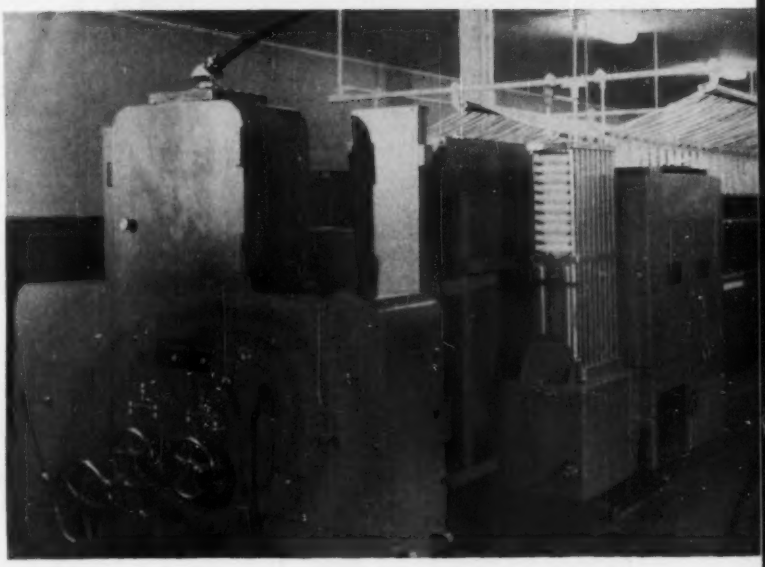
DRAWN SLIVER is spun directly into yarn by frame that drafts to 350. Cans of sliver last about one month when 40s is spun.

MECHANIZED SPINNING

. . . *Begins on page* 58

of two first-drawing frames. These frames are described as sliver-reversing draw frames. They deposit drawn sliver into cans on a rotating table. Then the trailing ends of stored sliver are automatically picked up, grouped into a lap of ten slivers, and fed to the second drawing.

The second drawing frame is an automatic-evening type. This frame automatically weighs sliver behind the frame and feeds the data to a pneumatic memory system and speed-regulating servo, which "evens" the finished sliver weight by varying the front-roll speed. Production of the second drawing frame is 40 to 60 pounds per hour, and front-roll speed is 330 fpm. The second drawing puts sliver into cans and automatically doffs the cans to await transfer to spinning.



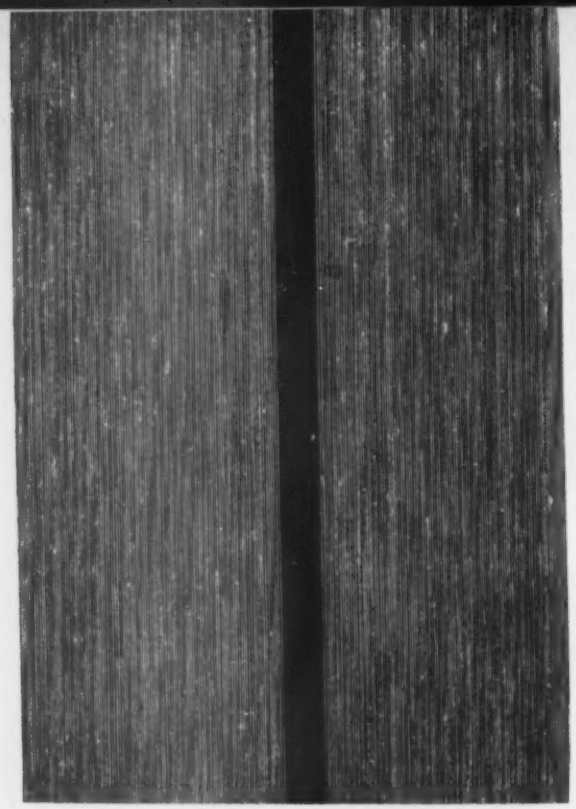
Step 6

AUTOMATIC DOFFER moves from frame to frame, sends mechanical doffing devices down both sides of frame at once, doffing 10 bobbins at a time.

Step 7

AUTOMATIC FEEDER supplies full bobbins to cone winder. Bobbins are extra long and fat.

. . . *Turn the page* ▶



YARN appearance board shows the uniformity of samples from two different yarns spun to 40s on the Toyobo system.

How the Yarn Measures Up

	Average	% Precision of the mean*
Cotton		
Staple and grade	1 1/16 in.	
Yarn number	40.4	0.8
Yarn strength		
Skein break factor	2312	2.8
Single end		
Break, grams	227	
% elongation	7.2	
% coefficient of variation	13.9	
Twist		
Turns per inch	24.6	6.4
Twist multiplier	3.9	
Yarn variation		
% range	85	
% U (Uster)	14.8	
Spectograph	No prominent repeats	

* The percent precision of the mean is the percent tolerance above and below the average value within which the averages of repeat tests are expected to fall. For ten tests, the acceptable precision for yarn number and break factor is often considered to be:

Precision	Rating
Below 2%	Excellent
Below 3%	Good

TESTS were made in a U. S. laboratory of two bobbins said to have been produced on the continuous-spinning system.

MECHANIZED SPINNING

. . . Begins on page 58

5, 6. SPINNING, DOFFING

Operators place the cans of drawing sliver behind sliver-to-yarn spinning frames that can draft to 350. An automatic doffer removes the full spinning bobbins. The doffer moves from frame to frame and doffs both sides at once, 10 bobbins at a time.

7. WINDING

Doffed bobbins then move by conveyor from an automatic feeder to automatic cone winding.

FEW MEN, FEW ENDS DOWN

People to run the operation? One man feeds the opener, the second tends drawing. Two spinners tend 3,000 spindles each. The fifth operator tends the winder.

Toyo claims that ends down per thousand spindle hours is about 14. The range of counts that can be spun is up to 40s.

How One Month's Operating Data Add Up (Futami Plant, Toyo Spinning Co.)

		Toyobo System	Conventional Machines
Percentage of waste:	Blowing	2.6	1.9
	Carding	4.3	7.0
	Total	6.9	8.9
Card slivers:	Foreign matter % (Shirley)	0.10	0.27
	Neps/grain	3.1	5.2
	Trash count/grain	1.7	4.5
	Uster U%	3.0	3.1
	Weight variation (6-yd. cut)	7.3	6.1
	Short fibers less than ⅜ inch (%)	9.5	14.2
Automatic drawing slivers:	Uster U%	3.0	3.5 (2 conventional drawings)
	Weight variation (6-yd. cut)	1.2	1.4
Yarns, 40s:	Uster U%	15.0	15.5–16.0
	Yarn weight variation (%)	2.0	1.7
	Lea strength (pounds)	5.8	5.6
	Uster nep count	5	9

The Fine Art of Discipline

Too many managers shun discipline because they think it's a brutal job. Fact is, "discipline" means more than mere punishment. It really means "training that corrects." And there needn't be anything nasty about it.

THE ONLY part of my job that I don't like is when I have to discipline one of my people."

Have you heard this popular supervisory complaint—or perhaps made it yourself? When it came out during a recent company conference in Virginia, we asked the man who had said it to tell us more.

His explanation was: "I just hate to bawl a person out." What he revealed by this explanation was that he, like many of us, has not taken the time to think through the matter of discipline.

WHAT IS DISCIPLINE?

First of all, the word comes from the Latin term that means "to learn." Turn to Webster and you'll find this definition: "Training that corrects, molds, strengthens, or perfects." But we in industry have forgotten this basic meaning, and have adopted as the only interpretation the secondary meaning: "Punishment, chastisement."

Because punishing or chastising a subordinate is distasteful to most of us, let's see if there is a better approach than the one most managers have been using.

When do you have to exercise this supervisory function? What happens that makes you become a disciplinarian? You don't become a disciplinarian when an employee makes an error in his work. Probably you see this mistake as an opportunity to show the erring worker what he did that was wrong and how to do it right. Nor is discipline, as the word is commonly used, the correct procedure when an employee just doesn't seem to get the hang of an operation, or complains that he just can't do a job you've assigned to him.

The average manager will probably take that opportunity to transfer the erring employee to another job, once he has exhausted the possibilities of explaining the present job successfully. Under normal circumstances, the supervisor doesn't discipline an employee if there's been a misunderstanding, or when innocent wrongs are committed, or when bad or sloppy work habits—which perhaps the supervisor has allowed to grow up—take on dangerous proportions.

Well then, if you don't discipline when you're faced with these many and bothersome departmental problems, when do you discipline? You probably find the bawling-out urge overpowering when:

. . . *There's an obvious and conscious infraction of shop rules.*

. . . *Known policies are not followed by your subordinates.*

. . . *Someone loses his temper and erupts with offensive language or takes a swing at a neighbor.*

. . . *A person gets out of line from normally accepted behavior.*

Most of us are old enough hands at supervision so that we can't jump down throats even when the above things are done—something holds us back.

DISCOVER THE BASE

You're familiar with "counting to ten," with "looking before you leap." Much more helpful than either time-worn prescription is asking the crucial question—why?

. . . *Why has Urso started another basketball pool,* after you've warned him twice before that gambling is against the rules?

. . . *Why has Mary come in again without her uniform?*

. . . *Why is Frank operating his machine without a guard* on it?

. . . *Why is Frenchie, who used to be one of the happiest and best-liked fellows in the mill all of a sudden blowing his top* every day of the week?

The idea isn't to go up to Urso or Mary and ask them. A better starting point is you yourself. Ask yourself why. The question can do several things for you. First, it will slow you down. Make you think. Then it may give you an entirely different slant on the behavior you disapprove of. And it quite possibly will suggest an explanation you can give or some training you can propose that will eliminate both the problem and the cause.

WHAT YOU'LL FIND

The first fact you can expect to pop up at you is that the culprit isn't enjoying his misbehavior at all. He's having an unpleasant experience. Humans would rather do things that make them happy than things that make them unhappy, and this is a fact you can use.

The next probability is that your candidate for discipline doesn't like the position his behavior puts him in. Even though he may disguise it, his desire to "belong," to be an accepted member of the group, is so strong that he is highly uncomfortable when he is out of line or out of step with his fellow employees. Again, here is a stabilizing force for your use.

If the miscreant isn't building up

By S. G. Williams
Management Consultant
New York City

his happiness or his sense of belonging, why is he acting as he is? Obviously he is getting some satisfaction out of it. But what satisfaction? There are three types of personal satisfaction that often form the base for discipline-demanding behavior:

1. Conviction
2. Resentment
3. Secondary outlets

SPOTTING CONVICTION

Not a rank-and-file worker, but a purchasing agent for a firm in Denver, provides the best example of this situation. He consistently violated a policy against accepting even the smallest gifts from suppliers. When he was finally called down for it, he had this to say:

"Look, Mr. Kingsley, these scroungy little things don't have any value for me. But I see it from the salesman's point of view. It's part of his job to distribute a certain number of these fountain pens, calendars, or whatever. The salesman knows that these things aren't really going to determine whether or not I buy his products. I just think our policy on this is overdoing it. It doesn't jibe with the facts of life. I'd spend twice as much time explaining why I can't accept gifts."

This man was expressing a conviction that he was saddled with an unwise regulation that was just unenforceable. The same thing can and does happen whenever a member of the organization believes a policy is wrong.

FEELING ABUSED

What do you do when you feel like you're getting the short end of the stick? When you're being treated unfairly? The chances are that you respond, or at least have a strong inclination to respond, with some antisocial, antiboss, or antirule behavior. You can achieve a lot of compensating satisfaction out of getting away with something or putting something over on the person you consider responsible for your sad lot. Occasionally, the resentment is so powerful that it can even provoke you to physically violent expressions, such as breaking something or wanting to break someone.

If you've never had such feelings, you're lucky—and unusual. But recognize that these feelings do occur in practically everyone else you know, including the people you work for and those who work for you.

SECONDARY OUTLET

It's amazing how many mothers-in-law are behind infringements of acceptable work behavior. Look behind the antisocial behavior and perhaps you'll find a lost lodge election or oversized department-store bills. A fellow may not be able to hit back at his wife's mother or his lodge brothers, but he can gamble on fighting back in his own work place, where he feels more at home.

The other day a loom fixer started storming around the overseer's office, tearing up a work order, scratching a mark in a desk top, and then breaking a pencil in two. His supervisor sensed that something outside the work environment was eating on the fixer. He suspected the young man was reacting to something else—was finding a secondary outlet for his rancor.

As it turned out, that was exactly the trouble. The loom fixer was still burned up by a phone call he had recently had from home. The television repair man charged him $22 to do a small service job.

Once he had given vent to his rage, he and his supervisor chatted for a few minutes and that was the end of that. Imagine what would have happened if the supervisor had blundered into a real squabble by bawling out the fixer for his behavior on the job.

This example helps illustrate the logical step after you have tried hard to answer the "why" yourself. Ask the person concerned. Sometimes you won't get the right or honest answer at first. It depends a good deal on how much he trusts you, the kind of relationship you ordinarily have with your subordinates. But a bit of patience and digging usually turns up the real cause of the trouble—the real root.

Then, knowing the cause, what action can you take in place of the old-fashioned "discipline" of punishment or chastisement?

FINDING A REMEDY

Let's go back to Webster's definition of discipline as "Training that corrects, molds, strengthens, or perfects." Take our cases:

Take Urso and his basketball pools, for instance. A similar case revealed that the shop promoter was seriously worried about some unpaid bills. He hoped, somewhat desperately, to recover his financial stability by winning his own pool. An hour with the personnel manager resulted in a slightly adjusted family budget, an arrangement to pay the bills in easy stages, and a happily "reformed" ex-promoter.

With uniform-less Mary and the gift-taking purchasing agent, nothing was required but giving them more information, a fuller explanation, and understanding of the reasoning behind the rules and policies. Frank's supervisor went at the no-guard problem a little more indirectly, but no less effectively. He put Frank in charge of safety for the department—"especially guards"—and gave him an inspiring talk on the advantages of winning the plant safety award for the next month.

There will be times when disciplinary situations will point up the need for a training class, or call to mind a certain book or article that would help the misbehavior mend itself. Local colleges often have lectures or courses that will explain and satisfy the needs turned up by this approach to discipline.

PLAY UP THE POSITIVE

Most of your people go along day after day obeying the rules, following the policies as best they know how. They get along well with coworkers, bosses, and subordinates—and chances are you pay scant attention to them. How about some kind of recognition or reward for *not* creating disciplinary problems? Could be that premiums for adjustment might eliminate the need for penalties for maladjustment.

Your people might tell you their convictions, if you'll listen thoughtfully to them, rather than expressing those convictions in broken rules. They're quite capable of suggesting the training they need—to a receptive and interested listener.

Coming: More Speed, Higher Quality

That's the latest word from Georgia, where new slashers and better loom equipment are upgrading quality-control practices, raising efficiency.

HIGHER SPEED, better quality, less waste. These were the key points in discussion as members of the Textile Operating Executives of Georgia met recently at Georgia Tech (Atlanta). Focus of their attention: new slashers and slasher equipment, and loom auxiliaries.

SLASHING—FASTER

You'll find lots of new slashers in Georgia mills. Even so, enough mills have been using new slasher units long enough to render significant reports. Here are some highlights:

High speed—This, with resulting high production, is the universal payoff. To get high speeds, mills run light warp sets through one size box and heavy sets through two size boxes. This way, the top mill maintains 110 yards per minute on light sets and 100 on heavy sets. (Dividing line between light and heavy is about 3,000 warp ends.)

Output per slasher ranges from a low of 900 pounds on heavy sets to 1,200 on light. But on one new wide (78-in.) slasher, production is already 1,750 pounds per hour—and will go even higher as soon as the slasher is broken in.

How to avoid a 15 to 20% slack-off in speed after the first year? Keep equipment in good working order. Buff squeeze rolls often.

Vigilant on viscosity—Georgia operators don't leave size viscosity to chance. They use instruments—recording and controlling. Most mills check from once a day to twice a week with a viscosity cup. They control the variation of size viscosity within 1%.

Mills that check size pickup closely find that without correction there's a variation of 1 to 2½% from creep speed to running speed.

One mill has added a three-way solenoid and a squeeze-roll control valve to each size box and a two-pole relay (with two normally closed and two normally open contacts) to every two size boxes. The valves are preset to desired creep-speed pressure. Test samples now show that 15 psi. at creep speed and 30 psi. at running speed will give about the same size pickup.

A second mill uses a solenoid switch to release squeeze-roll pressure at creep speed.

Less waste—Slashers are a focal point here. A mill that has slashed 1,650,000 pounds of yarn with 1.5% over-all waste gives much of the credit to positively driven creels. Another mill reports a low of 0.16% waste at the front of the slasher and 0.15% at the back. A third mill runs section beams on 24,000-yd. sets with 5% waste in creeling.

Stretch controlled—Most mills are keeping the stretch below 2%. One mill has equipped its slashers with a speed indicator and with a stretch indicator at the panel at the front of the slasher. This way, it holds stretch between 1½ and 2½% on 1.40s to 20s yarns and on many types of plied and fancy yarns. These slashers have nine cylinders. Ends in a set range from 392 to 9,000. Section beams are 30 inches in diameter.

A second mill has a built-in indicator that controls stretch at 1 to 1½% on sheeting, 1½ to 2½% on Type IV twills and gabardine.

WEAVING—BETTER

Speed-up for looms—Since 1957 one mill has been running 100 Unifil units on 44-in. looms with two side filling forks. The looms have run continuously on 108x56 construction, 1.39 yard per pound, three-up and one-down, Type IV work clothing. Warp yarn is 15s; filling, 13.25s. Efficiency has been 93.5 to 94%. Seconds have ranged from 3.5 to 7%, averaged 5.25%. Another average: 1 mispick per 125 yards of fabric.

Of these 100 looms, 98 are running 8-in. bobbins. Two of them are running 7⅜-in. bobbins in smaller shuttles at 192 ppm. Maintenance cost per loom for a recent 12-week period averaged quite low—only $0.5663.

Upping quality—Ten mills are using No. 14 shuttle checks. Four are only testing the checks on a few looms. The other mills have large installations.

In fact, one mill with 320 looms is running 50-in. X-2 looms at 173 ppm. These looms also have link-type parallels. A group of 100 looms at this mill gave real trouble before the No. 14 checks were installed. Efficiency was low, seconds were high, loomfixers and weavers were unhappy. The new checks and parallels eased these problems.

A second mill has been running the No. 14 shuttle check on 82-in. looms for eight months. The looms have link-type parallels. Results: better shuttle boxing, truer shuttle flight, better control of kinky filling, less picker-stick breakage. Only disadvantage: Checkstrap life is a little shorter.

Link-type parallels—They're in for keeps at all 10 mills that have tested them. Eight have enlarged their original installations. The other two are still testing.

The mill with the biggest installation went all out 3½ years ago with 349 looms. With link-type parallels it has raised loom speed 10 ppm. Cloth quality is higher, and maintenance cost is lower.

Another mill is running 320 link-type parallels on 50-in. X-2 looms. Plans are to add even more.

Advantages? Improved shuttle flight, better shuttle boxing, fewer warp and filling stops, fewer mechanical stops, less maintenance, lower supply costs.

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CLAIRTON, PENNSYLVANIA

TEXTILE WORLD

CHEMICAL TREATMENT AND FINISHING

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For more satisfactory carpet shades, the man to see is at Sandoz

Whether your carpet is wool, cotton, or nylon, Sandoz dyes and dyeing formulas can help you offer improved color fastness and levelness. Recent improvements credited to Sandoz technology include the dyeing of wool at the iso-electric point (using Lanasyn dyes and Lyogen SMK) and the barre-free dyeing of filament nylon with Lyogen P and Lyogen SF. For your cotton products, Sandoz provides the fastest-to-light directs (Lumicrease colors) as well as a full line of vat dyes. Sandoz can offer you shade matches completely compatible with all types of carpet backing.

For details and particulars, write, wire or 'phone headquarters: SANDOZ, INC., New York 13; Charlotte 5, N. C.; Cincinnati 26; Hudson, Mass.; Los Angeles 13; Philadelphia 34.

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THINKS AHEAD WITH TEXTILES

SANDOZ

News of the Month in . . .

Textile Chemicals

By ROBERT W. PINAULT, Associate Editor, TEXTILE WORLD

Modified Disperse Dyes Now Work Better Than Ever on Acrylic Fibers

You can get two to three times deeper shades on acrylic-based fibers with modified disperse dyes described in British Patent 853,217 to Sandoz Ltd.

Acrylics based on polyacrylonitrile or copolymers of this material with vinyl acetate, vinyl pyridine, ethyl methacrylate, etc. will respond in this way to disperse dyes that have a cationic rather than an anionic dispersing agent in their composition. Most disperse dyes now produced are supplied with anionic dispersants.

Dyes of the styryl, nitro, azo, anthraquinone, and naphthoquinone series are especially suitable for the switchover to cationic dispersants. It is also possible to pretreat the fabrics with a cationic dispersing agent and dye them with a disperse dye free from anionic dispersing agents. The dyes may contain a nonionic dispersant.

Cationic dispersing agents that are suitable for the purposes include the Sapamines (Ciba), the alkyl pyridinium chlorides (for example, lauryl and cetyl pyridinium chlorides), and N-para-stearoylaminophenyl-N·N·N-trimethyl ammonium methosulfate.

Better dye pickup in dyeing or printing operations is possible if a cationic dispersing agent is also added to the dyebath or print paste.

Aerosol Silica Improves Wool-Spinning Oil

Wool oils that contain finely divided silica particles in the range of 15 to 50 millimicrons improve the spinning qualities of woolen yarns, according to British Patent 840,372 to Monsanto Chemicals Ltd.

The dispersions are made by dissolving lanolin in a polyethylene glycol (molecular weight 150 to 650) and adding the impalpable silica aerosal so as to get 6 to 10% of silica content.

Satisfactory dispersions typical of this idea are made with:

Oleine	100 parts
Lanolin	2 parts
Silica (Aerosil)	10 parts

Another formula is:

Oleine	100 parts
Silica (Santocel 54)	10 parts
Dioleate of a polyethylene glycol (Nonex 69)	2 parts

Japanese Claim Wash-Wear Finish for Silk Fabric

Shinei Silk Co., Kobe, Japan, has developed what the company claims to be the first wash-and-wear finish for silk.

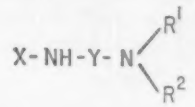
The silk in yarn form is first treated with a cationic softener and then a resin is applied. Fabric hand is somewhat firmer and bulkier than for untreated silk, and the goods are wrinkle resistant.

The usual loss in degumming (20 to 23%) is reduced to 3% by the addition of the resin. The treated yarn is suitable for taffetas, organdy, shantung, necktie, and obi (sash) fabric. Cost is about $28 per bale more than untreated silk.

New Dyeing Assistant Serves Several Purposes

Good leveling power, softening, and antistatic properties are combined in a dyebath assistant recently developed and announced by Farbenfabriken Bayer A. G.

Designed to aid dyeing of polyacrylonitrile fibers, the product is classed as an amido-amine that conforms to this general formula:



X is an acryl residue of a carboxylic or sulfonic acid containing a saturated or unsaturated chain of 10 to 18 carbon atoms.

Y is an alkylene radical of 2 to 6 carbon atoms, and R^1 and R^2 may be the same or different alkyl radicals of 1 to 4 carbon atoms.

A suitable amidoamine is 1-stearylamide - 3 - dimethylaminopropane acetate.

New Naphthols, Bases Are More Heat Resistant

New naphthols and bases developed and patented by Farbwerke Hoechst A. G. give shades on polyamide fibers that are resistant to heatsetting treatments, according to the developers.

Browns and blacks based on older naphthols and bases tend to go off shade badly under the heat treatments necessary to get dimensional stability of the fabrics.

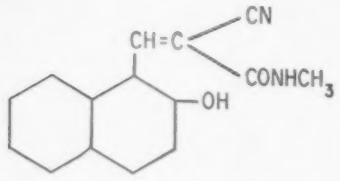
The new series of naphthols are arylamides of 5:6:7:8-tetrahydro-2-hydroxynaphthalene-3-carboxylic acid. The bases are 4:4′-diaminodiphenyl compounds, of which a number are particularly specified.

New Fluorescent Whitening Agent Yields More Neutral White Shades

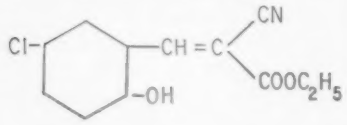
Fluorescent whitening agents based on methine produce more neutral shades of white and have good lightfastness, according to British Patent 846,148, which is issued to Farbenfabriken Bayer A. G.

Two types have been made. One is water soluble and is suitable for animal or cellulosic fibers. The other is sparingly water soluble and can be applied to the polyester, polyamide, or acrylic fibers.

One product that works well on acrylic fibers is made by reacting 2-hydroxy-1-naphthaldehyde with cyanacetmethylamide. Here's the formula:



Another of this kind is the product of 5-chlorosalicyaldehyde with cyanectic acid-ethyl ester:



Here's How Reactive Dyes Combine with Cellulose

Recent investigations of how the Procion type of reactive dyes actually combine with cellulose bring out two important facts:

In most cases, only one of the two Cl atoms present in Procion dyes actually combines with the cellulose material.

And it is the primary hydroxyl group in cellulose ($-CH_2OH$) that is most reacted on. The secondary hydroxyl groups are differently distributed in the cotton molecule and are subject to different spatial effects. Chemists at Imperial Chemical Industries Ltd. find that the primary hydroxyl groups react 10 to 15 times more rapidly with Procion dyes than do the secondary hydroxyl groups.

Benzophenone Compounds Make Polyester Fibers More Resistant to Light

Polyester fibers can be made resistant to degradation by sunlight if they are treated with certain benzophenone compounds, according to a patent issued to General Aniline & Film Corp.

The compound does its work regardless of whether dyes that may be used are an aid or a hindrance to light degradation. Application is in the dyebath, and it is customary to use about as much protective material as dye. A suitable benzophenone compound is 2:2′-dihydroxy-4-4′-dimethoxy benzophenone, which is fast to subsequent hot soaping or laundering.

Glycol Treatment Raises Safe Ironing Temperatures Of Triacetate-Fiber Fabrics

Any one of several carboxylic esters, ethers, or ether-carboxylic esters of polyhydric alcohols such as glycol, diethylene glycol, or glycerol can be used to raise the safe ironing temperature of triacetate fabrics.

Protection up to 220 C. from a normal 180 C. is possible if, for example, such goods are treated in a 30% solution of diethylene glycol diacetate, squeezed out, and steamed for 15 minutes at 100 to 104 C. Alternately, the padded goods can be put through a molten metal bath at 120 C.

Other materials that can be used include glycerol mono-, di-, or triacetate, glycol mono-methyl (or ethyl, or butyl) ether, or diethylene glycol monoacetate. Goods may also be worked in a bath that contains 30% of glycerol diacetate for 3 hours at 60 to 99 C. to get a similar result. The treatment is covered by British Patent 852,729 to British Celanese Ltd.

New Wrinkle on Old Dye System Aids Treatment Of Triacetate Fabrics

Going back to solvent-dyeing methods used in this country as far back at 1945, British Celanese Ltd. proposes variations that could be of interest to dyers who have sufficient volume to warrant continuous dyeing of triacetate fabrics.

Early solvent-dyeing systems for acetate fabrics were based on denatured alcohol and sodium thiocyanate. The new version is based on water-acetone solutions in which the acetone content is held to 54 to 55%. Higher acetone concentrations affect fiber nature adversely.

But by adding 4 to 15% of ammonium thiocyanate (based on the weight of the acetone-water solution), the effect of a 58% acetone solution is obtained.

Satisfactory dyeings can be made with as little as 45% acetone plus the thiocyanate. It is also possible to replace part of the water with methyl, ethyl, or propyl alcohols without substantially affecting the fiber.

The method aids in both dyeing and printing of neutral-dyeing premetalized dyes, azoic dyes, and disperse colors.

Goal of Cotton Research: Improve Resiliency and Hand of Cotton Fibers

Continuing efforts to improve the resiliency of cotton fiber will be sponsored for another year by the National Cotton Council.

Improvements in resiliency have already been provided by chemical finishing. Dr. Leonard Smith, Director of the Council's Utilization Research Division, warns that a genuine scientific breakthrough is needed to make cotton as resilient as wool.

In addition to improvements in wash-and-wear effects, research will concentrate on better drape, elasticity, warmth, hand, and resistance to matting.

Over a million bales of cotton went into chemically finished fabrics last year. Improved resiliency alone would help cotton compete with

fiber markets that now consume the equilavent of 4.6 million bales.

A total of $45,000 is available for further studies on resiliency in 1961 at the Textile Research Institute, Princeton, N. J. Of this amount, the Council is contributing $15,000.

The balance will be supplied by 12 sponsoring textile plants finishers, and textile chemical manufacturers.

New Nonwoven Binders Are Fast to Cleansing Process

Stable, colorless binders for nonwoven fabrics are the subject of a recent patent issued to Rohm & Haas. The products bind webs securely with a water-insoluble polymer that is also heat resistant.

The binders are applied as an aqueous dispersion, and are equally adherent to hydrophobic or hydrophilic fibers including glass.

Typical of such bonding agents are:

25 parts of a 7.5/92.5 copolymer of beta-hydroxyethyl vinyl sulfide and butyl acrylate.

2 parts of tertiary octylphenoxypolyethoxyethanol containing about 35 oxyethylene units.

0.4 parts of a wetting agent such as octylphenoxyethoxysodium sulfate, for example.

0.1 part of a silicone-based antifoaming agent.

And:

25.0 parts of a 10/20/70 copolymer of beta-hydroxyethylvinyl ether, butyl acrylate, and ethyl acrylate.

2 parts of tertiary octylphenoxypolyethoxyethanol containing about 35 oxyethylene units.

Sufficient methyl cellulose to give the desired viscosity.

Webs impregnated with either of these formulas are dried at 220 to 240 F. and cured at 300 F. or higher for 3 minutes.

Quaternary Groups Solubilize New Dyes for Acrylics and Vinylidenes

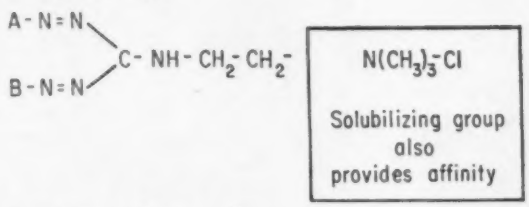
Dyes particularly suited to coloring acrylic or vinylidene fibers are solubilized by a quaternary ammonium group rather than sulfonic or carboxylic radicals. Shades are fast to light and ironing.

A coupling compound such as 5-hydroxy-1-(beta-trimethylammoniumethyl)-amino-naphthalene chloride is reacted in two stages with either two moles of a diazo compound or one mole each of two different diazo compounds.

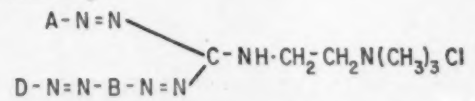
Typical constructions of these dyes are show below.

The dyes have good affinity for the fibers at the boil. Farbenfabriken Bayer A. G. holds British Patent 849,994 on the process of manufacture.

A disazo dye



A trisazo dye



Did You Know . . .

. . . that the best antichlor for resin-finished goods is sodium bisulfite? The yellowing of cottons finished with urea-formaldehyde-based resins is better controlled if bleaching with hypocholrite is followed by treatment with sodium bisulfite. A full report on the control of chloramine formation during bleaching and the subsequent breakdown of the compound under heat is available in Bulletin of the Institute Textile, France, No. 86 (Jan.-Feb., 1960).

■

. . . that some detergents that carry peroxygen bleaches in their formulation are causing complaints of poor lightfastness? Sequestrants in home detergents are also suspected of removing copper from after-treated dyes, which then may drop from 80 to 20 hours Fade-Ometer fastness.

■

. . . that a punch-card system that controls every step of a dyeing operation has been developed? In the research laboratory of Courtaulds Ltd., two single-arm yarn dyeing machines are operating by this method. Initial charge, salt, dye, rinse, and finish cycles are programmed to predetermined elapsed times. Check points are included also. The system provides good reproducibility, and further improvements in control are being considered. These could include self-checking of shade and rate of rise control for the dyebath, both available today.

■

. . . that a Japanese concern is producing a polyamino acid that has textile-fiber potential? Still in the laboratory stage, the product is related to sodium glutamate, now used in food seasoning. The Ajinomoto Co., Inc., developed the polyamino acid and plans to market it as a raw material from which fiber producers can spin textile fibers.

■

. . . that a little ammonia in the rinse water will speed up the rinsing out of soap after a washing process?

What's New In Dyes and Chemicals

Scouring Softener

Scoursoft 3055 . . . provides scouring and softening effects in one operation. Supplied as an off-white fluid paste, the product will effectively wash all-wool or wool-blended fabrics.

This cationic product gives a soft, lofty hand to goods. Hard water does not affect Scoursoft 3055, and it is stable to acids, dilute alkali, and normal storage conditions. Richmond Oil, Soap, & Chemical Co. **(Circle D-1 on Reader-Service Card)**

Synthetic Lubricants

Rubberknit . . . brands a series of completely synthetic lubricants designed for various phases of knitting, covered or uncovered rubber thread, or coning.

The **Rubberknit 230** series is useful as a needle lubricant in knitting covered or uncovered rubber thread. There is no animal, vegetable, or mineral oil in the compound. Lubricant scours out easily and has a minimum effect on tensile strength of rubber, and little tendency to swell rubber.

It is used at full strength and will not induce corrosion of metal parts.

The **Rubberknit 300** series is recommended for coning man-made-fiber yarns. The lubricant imparts good antistatic qualities to the yarns and is readily scoured out. Other properties are similar to the 230 series except that it is of lighter viscosity.

Rubberknit 1633 is a synthetic lubricant also designed to be used in oil cups at knitting machines. It is water-dispersible and scours out readily. Other characteristics are similar to those of other numbers in the series. Richmond Oil, Soap, & Chemical Co., Inc. **(Circle D-2 on Reader-Service Card)**

Fungicide

Fungitrol 11 . . . provides fungicidal and bactericidal qualities to vinyl films that are used in coating textiles or in extrusions of 100% vinyl.

The product is nonmetallic and is stable to light and heat. It is nonstaining and has long-lasting qualities at low concentrations.

Low-odor and nontoxic qualities make the fungicide-bactericide safe for wearing-apparel use. Heyden Newport Chemical Corp. **(Circle D-3 on Reader-Service Card)**

Reactive Dye

Procion Brilliant Blue H5GS . . . is valuable in producing brilliant self shades in the turquoise range somewhat redder than Procion Brill. Blue H7GS. The dye is applied by conventional methods for reactive dyes. It has excellent build-up properties and does not stain adjacent whites in printed goods while the wash-off operation is taking place.

The dye is suggested for continuous dyeing processes where its low affinity and ease of wash-off are of great value. Arnold, Hoffman & Co., Inc. **(Circle D-4 on Reader-Service Card)**

Nonslip Weighter

Rexobond 46 . . . provides weighting and nonslip effects on fabrics to which it is applied.

Supplied as a liquid, the product disperses readily in water and is compatible with dye-fixing agents, resins, and water repellents. When it is used with semidurable water repellents, spray ratings are maintained while the hand of the fabrics is improved. Emkay Chemical Co. **(Circle D-5 on Reader-Service Card)**

Direct Dye

Calcodur Resin-Fast Blue 3G . . . is particularly suitable for dyeing goods that are to be resin finished. The dye exhibits minimum shade change with resins or water repellents, and does not lose lightfastness at all.

Dyeings made with this color are a greenish-blue, well adapted to the production of aqua and turquoise shades with other dyes. Reserve on acetate is excellent. American Cyanamid Co. **(Circle D-6 on Reader-Service Card)**

Fluorescent Colors

"Strike" . . . brands a range of eight opaque fluorescent colors that are designed for screen-printing processes on textile materials. Advance Process Supply Co., Inc. **(Circle D-7 on Reader-Service Card)**

Red-Violet Pigment

Quindo-Magenta RV-6803 . . . is offered as a self or shading pigment to produce red-violet shades or fiery red shades with molybdate orange.

The pigment is useful in textile printing or coating operations, where it exhibits good resistance to bleeding and sunlight. Allied Chemical Corp., National Aniline Div. **(Circle D-8 on Reader-Service Card)**

Chelating Agent

Pentex BLN . . . has a specific complex-binding capability for trivalent iron and other metal ions, especially at high pH. For 0.1 grams trivalent iron, 1.5 grams of the product are required at pH 11 and 20 C. Sou-Tex Chemical Co., Inc. **(Circle D-9 on Reader-Service Card)**

Developed Dye

Polimize Brown PLM . . . is well suited to the production of washfast browns on cotton yarn dyed in package form.

The color has good tinctorial power, dyes levelly, and when developed by the Polimize process, exhibits excellent washfastness and good lightfastness. Althouse Chemical Co. **(Circle D-10 on Reader-Service Card)**

Dyefixing Agent

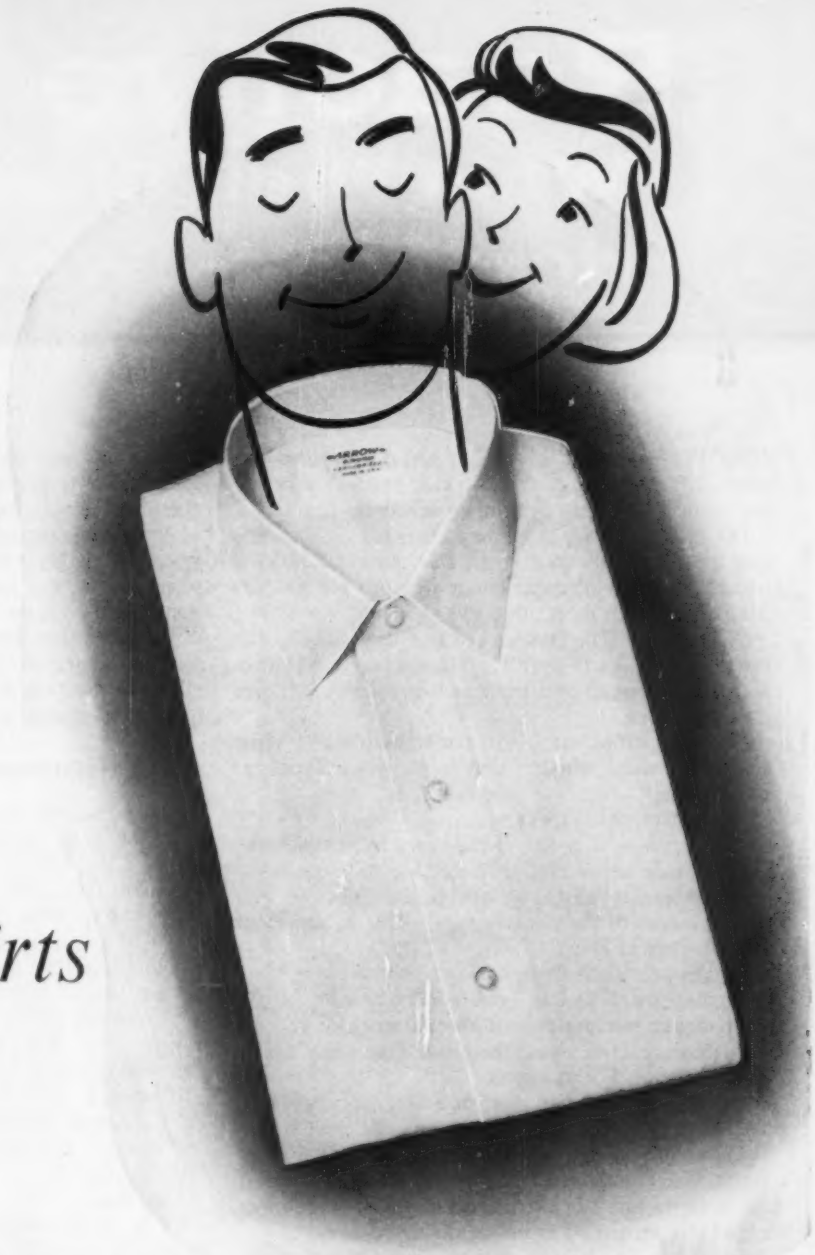
Cassofix 4509 . . . is a liquid cationic product that has low affinity for cotton fiber. The fixative is recommended for package-dyeing processes of all types. The product is insensitive to sulfate residues from dyeing and does not affect shade or lightfastness of colors. It can be used in discharge printing. Sou-Tex Chemical Co., Inc. **(Circle D-11 on Reader-Service Card)**

Cationic Softener

Fibramoll CNS . . . gives good lubricating, softening effects on cotton and man-made fibers. It can be used in the same bath with optical brighteners and dye fixatives and will not yellow whites. It comes as a liquid or a 100% active material. Sou-Tex Chemical Co., Inc. **(Circle D-12 on Reader-Service Card)**

Solvay Activated Hydrogen Peroxide Bleaching Process gives

a whiter, brighter white to Arrow shirts



You always look your best in an Arrow shirt . . . there's good reason. Cluett, Peabody & Co., Inc., maker of Arrow shirts, puts full emphasis on highest quality production. And that's the major reason they have adopted the *Solvay Activated Hydrogen Peroxide Bleaching Process.* It produces better hand and superior whiteness without harm to the goods.

Like Cluett, Peabody & Co., Inc., you can use the Solvay Activated Hydrogen Peroxide Bleaching Process to obtain higher quality, whiter cottons at no increase in cost. Or, if you prefer, you can get whiteness equal to your present results with a marked decrease in chemical costs.

Although the Solvay Activated Hydrogen Peroxide Bleaching Process is a relatively new method developed by the Solvay Process Division for bleaching cotton, it is already in full-scale, commercial operation in a number of plants. It is available to you under royalty-free license.

Solvay technical service is available, without obligation, to help you evaluate this new process for your plant. Or, send for Solvay's free booklet which gives a complete description of the techniques and results you can expect.

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CIRCLE 73 ON READER SERVICE CARD 73

Reactive Dyes

• What Their Chemistry Is
• How They'll Work for You

REACTIVE dyes hit the market about five years ago. When they did, they gave the textile industry a brand-new method of fixing dyestuff to cellulosic fibers.

The new method? A definite chemical combination with the fiber. By and large, this chemical bond is stronger than the physical bonds that are the primary fixing agents with most other dyes.

What structure do today's reactive dyes have? The structural formulas (Figure 1, on facing page, and others on following pages) and the text that follows will give you a clear idea.

What properties mark these reactive dyes? What factors determine whether they're for you? Look at the following:

- Washfastness is excellent.
- Lightfastness is good—if the bases from which the dyes are made are carefully selected.
- Resistance to gasfading can be incorporated into disperse colors of the reactive type. This is important in dyeing acetate fibers.
- Shades are relatively brilliant.
- Application is simple—but not foolproof.

But they're not perfect—If there's much to recommend these reactive dyes, there are also some weaknesses in them. For example:

- Initial cost is higher than that of many dyes that do a first-class job on cotton or rayon.
- Color losses, through combination of dye with solution water, may run up to 20%. That means you have to move fast—or meter out the alkali solution at the pad box separately from the dissolved dyes.
- Sensitivity to chlorine marks a number of these dyes. This means they are affected by laundering if a chlorine bleach is used—as often happens at home or in commercial laundries.

And what about resins?—Resin finishes have some effect on the shade of reactive dyes. But this is true with almost any dye. Dyers have learned to dye around and compensate for shade changes that are brought about by finishing procedures.

Resins affect the lightfastness of some of the reactive dyes. But you can minimize this effect by selecting dyes that are least affected.

Will these reactive dyes supplant other types of dyes that are firmly entrenched in dyehouses? Hardly. But they do represent an entirely new approach to dyeing—their ability to produce bright, fast shades by chemical combination with the fiber.

And as volume grows and new types are discovered, prices inevitably will drop. So, because they're destined now to be a part of nearly every dyehouse operation, you'll want to take a good look at them—structures, properties, applications of dyes now in use and soon to come. And you'll want to look even longer ahead to the time when the reactive principle will be further developed in printing—and even to finishing.

By A. J. HALL, BsC., F.R.I.C., F.T.I., F.S.D.C.
Textile Consultant, Somersetshire, England

START WITH PROCIONS

The Procions (Imperial Chemical Industries Ltd.) were the first reactive dyes developed for cellulosic fibers. Close after came the Cibacrons (Ciba), the Remazols (Hoechst), and the Procinyl range (suited to nylon and to some extent to acrylonitrile fibers).

All of these except the Remazols are characterized by molecules that contain a 1:3:5-triazine nucleus. To this nucleus is attached one or two reactive chlorine (or bromine) atoms that will react with cellulose or protein fiber. Figure 2 (page 78) pictures the reaction with cellulose for two types of Procion dyes.

Procion C dyes have two reactive chlorine atoms. They are more reactive than the Procion H types (only one reactive chlorine atom). So Procion C dyes are easily dyed at 30 C.; Procion H types, 80 C.

The reactive dyes designed for cellulosic materials carry a water-solubilizing group of the sulfonic or carboxylic acid type. But the Procinyl dyes are usually supplied in dispersable form and are not water soluble.

All reactive dyes react simultaneously with the fiber and with the water necessary for their application. The product of the reaction of the dye with water is colored but has little or no affinity for the fabric and is easily washed off. It is therefore important to set up dyeing conditions that will keep the dye-water reaction at a minimum. This is usually possible if manufacturer's recommendations are followed.

HOW REMAZOLS WORK

For reactivity the Remazol dyes depend on a vinyl sulfone group rather than the 1:3:5-triazine nucleus. A sulfuric acid group attached to the end of the vinyl sulfone molecule supplies water solubility.

Today
• What They Do
• What's Ahead

The reaction of a Remazol dye with cellulose is quite different from that of the Procion or Cibacron types. These latter react by substitution, with the active chlorine in the 1:3:5-triazine nucleus being replaced by Cell-OH residues in the cellulose. The Remazol reaction is additive. A dye-vinyl sulfone compound is first formed. This then adds on to the cellulose molecule in this way:

$$Dye—SO_2—CH_2—CH_2—O\cdot SO_3H + ALKALI \longrightarrow$$
$$Dye—SO_2—CH=CH_2 + H_2SO_4$$

At the same time, the addition process with cellulose is going on to give:

$$Dye—SO_2—CH_2—CH_2—O—Cell$$

All reactive dyes require an alkaline medium to complete the reaction. The reaction of alkali with the Procion and Cibracon types displaces the reactive chlorine to give sodium chloride. But in the Remazols the alkali causes formation of the dye—vinyl sulfone, which is reactive enough to add on to the cellulose fiber. Some alkali also combines with the free sulfuric acid liberated in the first step of the reaction.

Regardless of the type of reactive dye used, the chemical compound formed with the cellulose is a cellulose ether. The excellent washfastness of reactive dyes is due to this ether linkage, which is not easily decomposed in normal laundering procedures.

More recently, the Reactone (Geigy) and Drimarene Y and Z (Sandoz) types of reactive dyes have reached the market. These dyes are related to the older Procions and Cibracron dyes—they contain a halogenated 1:3:5-triazine nucleus. But it is possible to build in reactivity on old dye structures by attaching several different atomic groupings other than those that have been mentioned.

Figure 1 will give you a rundown on the early types and the more recent developments.

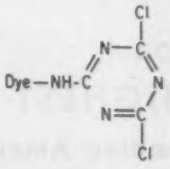
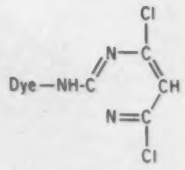
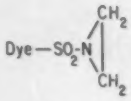
HOW EARLY DYES GREW

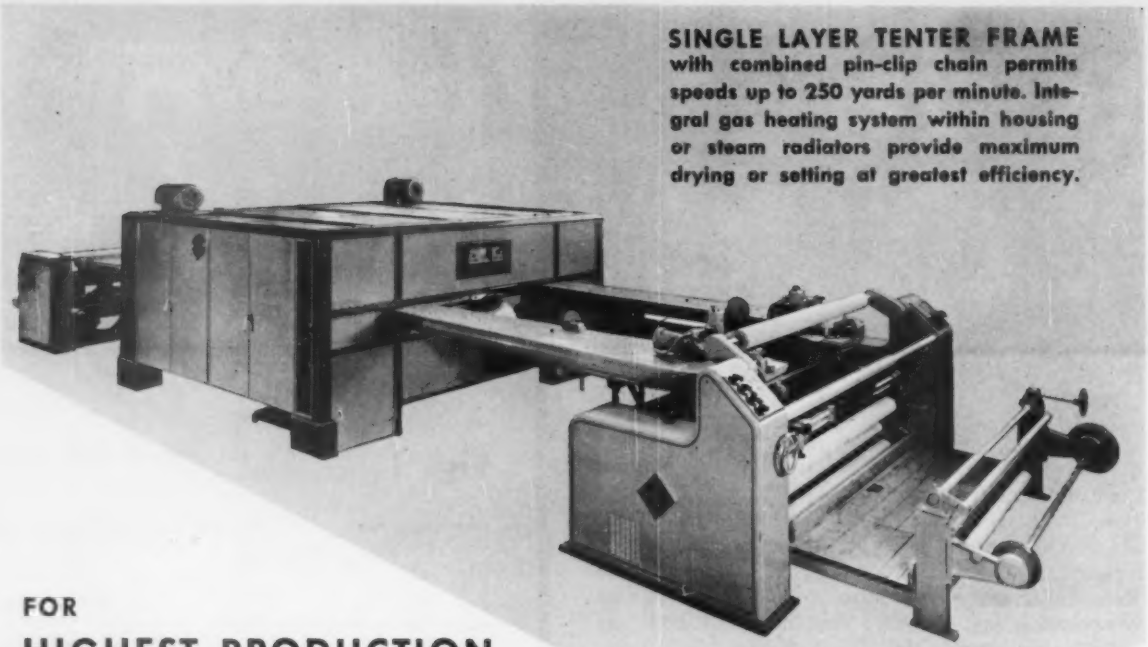
Cynauric chloride, as shown in Figure 3 (page 78), was the first reactive nucleus used to make a reactive dye. It was responsible for the Procion series.

The first step in making a reactive dye by this route is to replace one of the three reactive chlorine atoms with a suitable dye. Such a compound would then have two free reactive chlorine atoms that could react with cellulose.

. . . *Turn to page* 78

Fig. 1 These eight basic types of reactive dyes are available today.

Reactive group	Dye and attached reactive group
Mono- or di-halogeno-1:3:5-triazine	
Vinyl sulfone with attached sulfuric acid ester group	$Dye—SO_2\text{-}CH_2\text{-}CH_2O\cdot SO_3H$
Di-halogeno-pyrimidine	
Sulfonfluoride	$Dye—SO_2F$
Vinyl sulfonamide with attached sulfuric acid ester group	$Dye—SO_2\text{-}NH\text{-}CH_2CH_2O\cdot SO_3H$
Sulfo-ethyleneimide	
Sulfon-beta-chloro (or bromo)-ethylamide	$Dye—SO_2\text{-}NH\text{-}CH_2CH_2Cl$ (or Br)
Halogenated acyl	$Dye—CO\text{-}CH_2Cl$ $Dye—NH\cdot CO\text{-}CH_2Cl$ $Dye—NH\cdot COCH_2CH_2Cl$



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CIRCLE 77 ON READER SERVICE CARD 77

Fig. 2 How two Procion dyes react with cellulose.

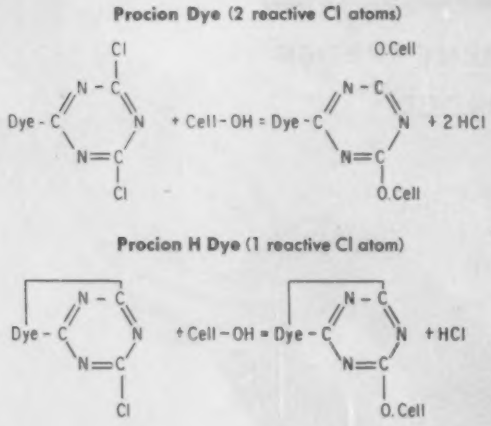


Fig. 3 Cyanuric chloride – first reactive nucleus used to make a reactive dye.

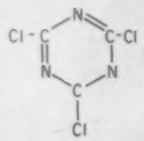


Fig. 4 How chlorine (or bromine) atoms are made available to react with cellulose.

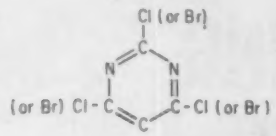


Fig. 5 This yellow dye, a halogenated pyrimidine, has this structure.

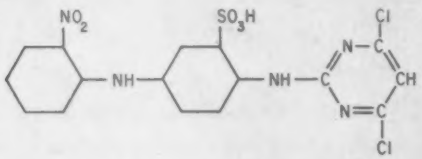
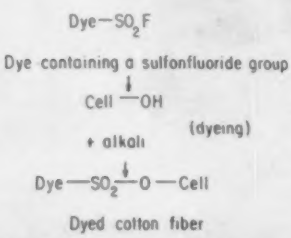


Fig. 6 Here is the role an alkali plays in coupling a reactive dye with cellulose.



REACTIVE DYES TODAY

. . . *Begins on page* 74

The next step is to react two of the chlorine atoms in the cyanuric chloride, either with two dye components or a dye component and a non-colored component. The latter can be introduced into the cyanuric-acid molecule first. This reaction paves the way for a number of cyanuric-acid derivatives that can react with dye components to give a wide variety of reactive dyes.

Such derivatives include 2:4-dichloro-6-phenoxy-1:3:5-triazine, 2:4-dichloro-6-methoxy-1:3:5-triazine, 2:4-dichloro-6-dimethylamino-1:3:5-triazine, 2:-dichloro-6-beta-hydroxyethylamino-1:3:5-triazine, and the like.

PYRIMIDINES USEFUL, TOO

Recently it became clear that cyanuric chloride can be replaced by a trihalogenopyrimidine having the formula shown in Figure 4. Reactive dyes can be made from this halogenated pyrimidine by the usual replacement of one or two chlorine or bromine atoms with a dye component, leaving two or one Cl_2 or Br_2 atoms to react with cellulose. A number of these dyes have been prepared. Their solubility usually comes from sulfonic-acid groups in the dye component.

A yellow dye of this type is made by reacting equimolor amounts of 2:4:6-trichloropyrimidine and 2-nitro-4-aminophenylamine-3:4-disulfonic acid to give the results shown in Figure 5. The dye is applied to cellulosic fibers with the aid of alkali, in the usual way for the 1:3:5 triazine reactive dyes.

OLD DYES MADE REACTIVE

Many of the older azo dyes that are used mostly for dyeing wool and have no affinity for cellulose carry a sulfon-fluoride group (— SO_2F). Low-temperature dyeings of some of these colors on wool and silk, with alkaline aftertreatment, will produce shades that have good fastness to washing. But if the alkali treatment is omitted, washfastness will be negligible.

These facts indicate that such dyes do combine chemically with protein fiber in the presence of alkali. Further tests with these dyes on cellulosic fibers show that with an alkaline aftertreatment, shade with good washfastness can be obtained.

Many dyes that contain a sulfon-fluoride group have been made by coupling diazotized primary amines containing such groups. For example: meta-aminobenzene-sulfonfluoride with azoic coupling components carrying water-solubilizing groups such as 1-(4′-sulfophenyl)-3-carboxy-5-pyrazolone. These new reactive dyes and their coupling action with cellulose are illustrated in Figure 6.

A recent development of Farbenfabriken Bayer A.G. is a new reactive dye similar to the Remazols. The Remazols can be represented as Dye—SO_2-CH_2-CH_2-O·SO_3H. But the new Bayer dyes can be represented as Dye—SO_2-NH-CH_2-CH_2-O·SO_3H. In the Remazols, coupling is made by the SO_2 (sulfone) group: in the new Bayer dye, through the SO_2-NH (sulfone amide) group.

. . . *Turn to page* 80

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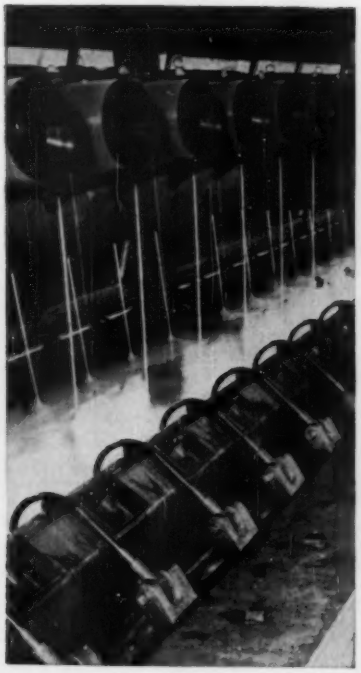

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HOOKER CHEMICALS PLASTICS

Fig. 7 How a yellow reactive dye of the sulfone amide group is made up.

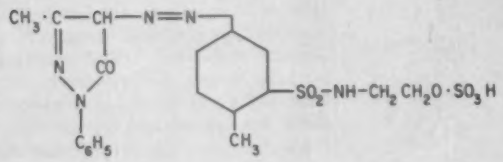


Fig. 8 This red reactive dye, adapted from an older nonreactive dye, is lightfast on cellulosics.

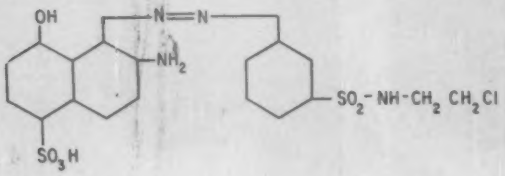


Fig. 9 How reactive dyes of the sulfonethyleneimide group are made up.

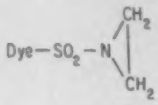


Fig. 10 A red reactive dye of the sulfonethyleneimide group looks like this.

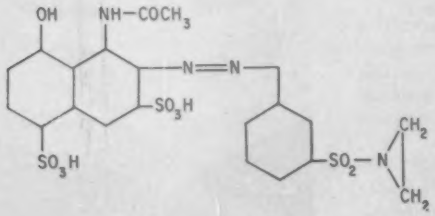
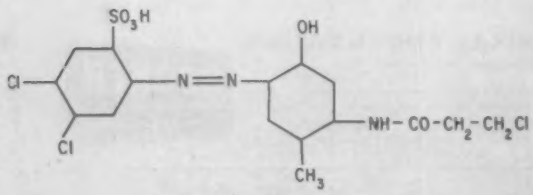


Fig. 11 How an orange reactive dye, with good wetfastness to cellulosics, is made up.



REACTIVE DYES TODAY

. . . *Begins on page* 74

A yellow dye of this type with good washfastness is made by coupling diazotized 1-amino-4-methylbenzene-3-sulfonic acid-beta-hydroxyethylamide with 1-phenyl-3-methyl-pyrazolone-5 and then esterifying the free hydroxyl group with sulfuric acid (Figure 7).

Such dyes are applied by padding from an alkaline bath and then heating the fabric to 100 C. for 10 minutes to cause coupling between fiber and dye. Dyes of this type made by Bayer include members of the azo, oxazine, dioxazine, triphenylmethane, anthraquinone, and azaporphin groups.

OLD DYES MADE BETTER

Some of the older wool dyes that contain a sulfon-beta-chloroethyl-amide group of the formula—SO_2-NH-CH_2-CH_2-Cl (or Br) were not fast to washing. But with reactivity these same dyes show outstanding washfastness on cellulosic fiber when applied in an alkaline medium. Dyes of this type, now becoming available, may be represented as Dye—SO_2-NH-CH_2-CH_2-Cl. They combine with cellulose by replacement of the Cl_2 group thus: Cell-O-CH_2-CH_2-NH-SO_2—Dye. A typical red dye has the formula shown in Figure 8.

These dyes are applied to cotton fabric in the pad along with a wetting agent. The fabric is dried at 50 C. and is then padded in a solution that contains 1% caustic soda and 30% common salt. The goods are steamed for one minute, then thoroughly washed.

NEW GROUPS FOUND

Imperial Chemical Industries Ltd. has discovered a series of reactive dyes in which the reactive component is a sulfonethyleneimide group. The general formula is shown in Figure 9. The base is a colored compound that contains one or more sulfonchloride (SO_2Cl) groups and is reacted with ethyleneimine. On the other hand, a diazotised primary amine that contains one or more sulfonethyleneimide groups is coupled with an azoic coupling substance carrying a water-solubilizing group such as sulfonic or carboxylic acid.

A red dye of this type can be made by coupling diazotised meta-amino-benzenesulfon-N-ethyleneimine with 1-acetylamino-8-hydroxy-naphthalene-3:6 disulfonic acid (Figure 10). When such a dye couples with cellulose, the sulfonethyleneimide group opens up so that the dye-cellulose ether formed has the formula Cell-O-CH_2-CH_2-NH-SO_2—Dye.

NEW TYPES—COMING FAST

Other reactive dyes continue to appear. For instance, a new series by Badische Anilin und Sodafabrik:

Dye—CO-CH_2Cl

Dye—NH-CO-CH_2-CH_2-Cl

A number of dyes of these types are possible, and reactive dyes can be built around azo, azomethine, and anthraquinone bases. They may be made from components that already contain the reactive group, or this group may be added to a dye. If added, and if the dye contains a primary or secondary amino

. . . *Turn to page* 82

New Rhoplex® acrylic resins for non-stiffening, non-yellowing backing for furniture upholstery

Extremely durable backings and binders for fabrics and carpeting—plus other advantages possible only with acrylic materials—are produced by two new self-crosslinking RHOPLEX acrylic resins that cure to tough, resistant polymers under catalysis and heat. The usual vulcanizing agents, plasticizers, and anti-hardening agents are not needed with RHOPLEX HA-8 and RHOPLEX HA-12.

RHOPLEX HA-8 is a highly durable acrylic polymer which produces finishes that withstand dyeing, washing, and drycleaning. It may be used alone, or in combination with fillers, thickeners, or other RHOPLEX resins.

RHOPLEX HA-12 is similar to RHOPLEX HA-8, but produces firmer finishes with improved tensile strength, and may be used with RHOPLEX HA-8 to obtain intermediate effects.

Both products are effective binders for non-woven fabrics, adhere well to synthetic fibers, are ideal for backcoating automotive and furniture upholsteries, and are good pigment binders. They resist discoloration and stiffening with age. They do not discolor fibers since the cured polymer is water-clear.

Other RHOPLEX binding and backing materials, such as RHOPLEX HA-4 and RHOPLEX B-15 may be used to modify RHOPLEX HA-8 and RHOPLEX HA-12.

Write Dept. T-1 for technical bulletins summarizing properties and uses of Rohm & Haas RHOPLEX acrylic materials for fabric finishes, backcoatings, and binders.

ROHM & HAAS

PHILADELPHIA 5, PA.

RHOPLEX HA-8 HA-12

CIRCLE 81 ON READER SERVICE CARD

Fig. 12 This blue dye is anthraquinone based and is fast to light and washing.

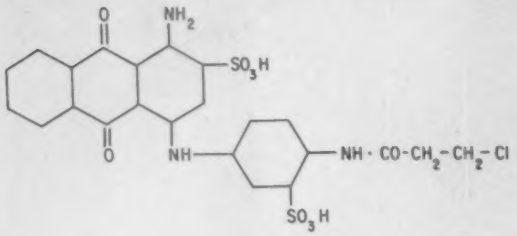


Fig. 13 Substituted naphthalene is the base for this new dye of the mono-azo group.

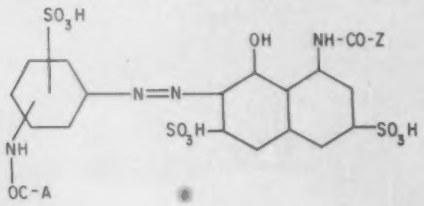


Fig. 14 This typical red reactive dye is made by diacylation.

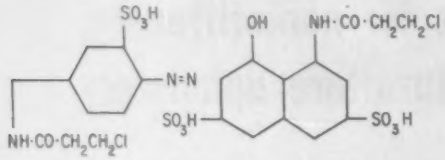


Fig. 15 Premetalized reactive dyes (like this) work well on cellulosic, protein, and polyamide fibers.

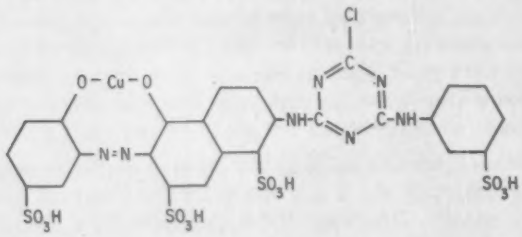
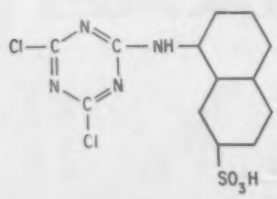


Fig. 16 Water-soluble halogenated triazine has a reactive effect on cellulosic fiber.



REACTIVE DYES TODAY

. . . *Begins on page* 74

group, this can be acylated with a carboxylic acid halide.

An orange dye of this type has the formula in Figure 11. It is made by coupling diazotised 1-amino-3:4-dichlorobenzene-6-sulfonic acid with 1-methyl-2-(omega-chloropropionylamino)-4-hydroxy-benzene. When applied to cellulosic fabrics with caustic soda, it gives an orange shade of good wetfastness.

An anthraquinone-based reactive dye uses the same reactive group to produce blue shades with excellent fastness to light and washing. The dye is made by reacting 1-amino-4-bromo-anthraquinone-2-sulfonic acid with 1:4 diaminobenzene-2-sulfonic acid, then acylating the product with beta-chloropropionic acid chloride. The formula is shown in Figure 12.

Substituted naphthalene is the base for another type of reactive dye newly developed by Ciba Ltd. This group is mono-azo. It conforms to the general formula in Figure 13. In this formula A represents a beta-halogen (chlorine or bromine)-ethyl group and Z another such group—or simply a benzene residue. The A group or groups provide reactivity. Because this group has the structure—NH-CO-CH_2-CH_2-Cl, these dyes are somewhat like those in Figures 12 and 13.

This type can be made in various ways. But usually a diazotised primary amine is coupled with an azoic coupling compound, either or both of which can contain the reactive beta-halogen-ethyl group or a free amino group capable of being acylated. Beta-chloropropionyl chloride is a useful acylating agent for such purposes.

A typical red reactive dye has the formula shown in Figure 14. It is made by coupling diazotised 4-beta-chloropropionylamino-2-aminobenzene-1-sulfonic acid with 1-beta-chloropropionylamino-8-hydroxy-naphthalene-3:6-disulfonic acid. The recommended application is to pad on the dye, steam the padded goods for 1 minute at 100 C., then run them through a ½% solution of sodium bicarbonate to bring about chemical combination of dye and fiber.

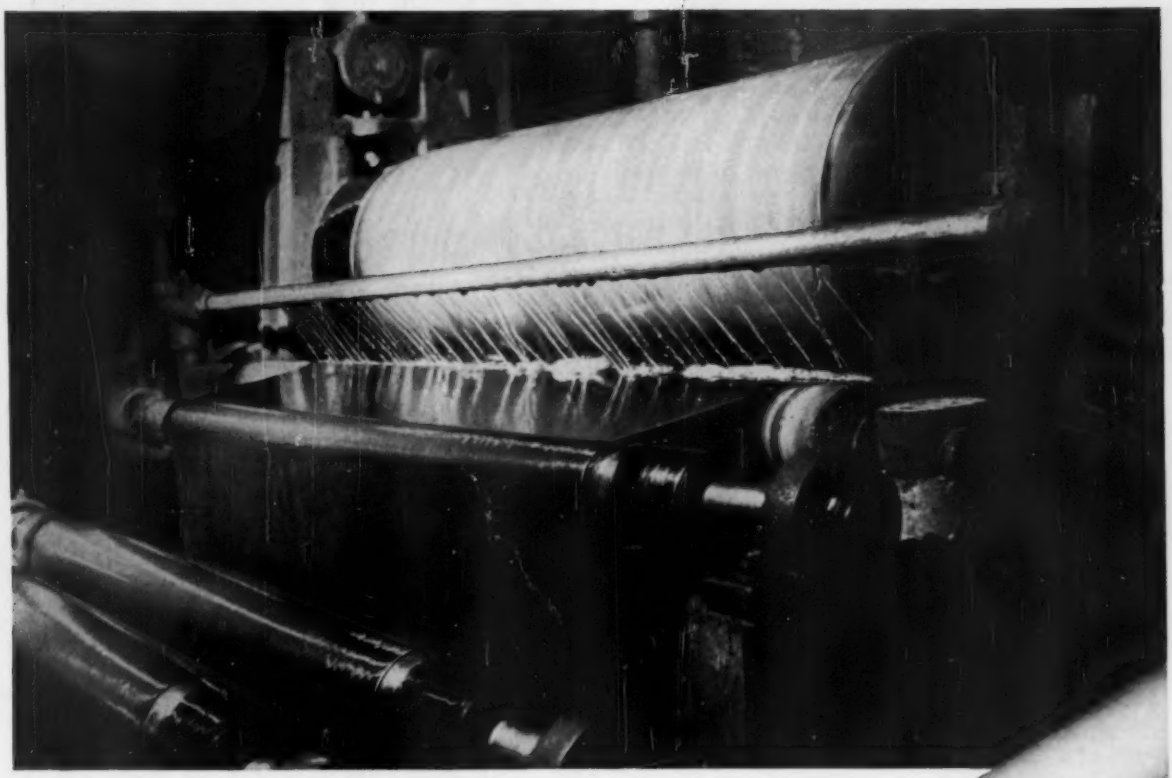
EVEN PREMETALIZED DYES

Another recent discovery is that premetalized dyes, primarily used on protein fibers, can be made reactive and thus useful for cellulosic fibers. Early trials indicate that these dyes not only have excellent fastness to light and washing. They also resist bleaching treatments. Most reactive dyes in use today are sensitive to chlorine. So a chlorine-resistant range of reactive dyes would be most welcome.

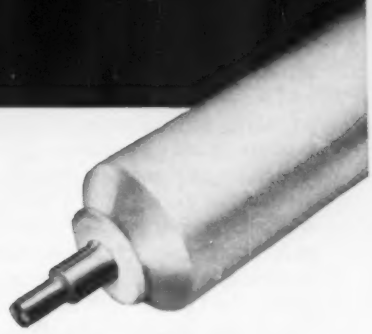
These premetalized reactive dyes are also suitable for dyeing protein and polyamide fibers from a weakly-acid bath. A typical dye of this kind has the formula shown in Figure 15. The copper is introduced by treating the azo portion of the dye with copper sulfate, then condensing the metalized product with cyanuric chloride to leave two free Cl_2 atoms. Finally the condensate is reacted with metanilic acid, leaving one reactive Cl_2 atom. One problem to be expected in manufacture is introduction of the copper to the 1:3:5 halogenated triazine nucleus without disturbing the reactive chlorine atoms.

. . . *Turn to page* 84

NOW... BETTER WATER REMOVAL AT LOWER COST



MANHATTAN TEXTRACTOR AND TEXROC ROLLS



Crack-resistant cover and compounding methods enable a Manhattan Textractor Roll to extract *more* water—reduce crush on the mangle roll! Hard white cover on the Manhattan Texroc Roll actually extracts up to 10% more water than metal rolls—minimizes chemical and dye build-up, eliminates pitting! The result? Better roll performance and longer roll life . . . "More Use per Dollar" on your textile machines.

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"MORE USE PER DOLLAR"

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ROLL COVERING PLANTS AT PASSAIC, N.J. • NEENAH, WISC. • N. CHARLESTON, S.C.

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ENGINEERED RUBBER PRODUCTS . . . MORE USE PER DOLLAR

CIRCLE 83 ON READER SERVICE CARD 83

DO-IT-YOURSELF REACTIVE DYES

Up to this point, we've talked about reactive dyes supplied by manufacturers. But increasing knowledge of ways to make dyes reactive has turned chemists toward making reactive dyes more or less on the spot by combining suitable dyes with water-insoluble halogenated triazines such as 4:6 dichloro-2-phenyl-1:3:5-triazine or 4:6-dichloro-2-methyl-1:3:5-triazine.

Many more reactive groups can be formed by condensing cyanuric chloride with amines and alcohols, such as methylamine, aniline, alpha-naphthylamine, beta naphthol, and phenol. In general, these halogenated triazines are colorless. So there is little change in shade when they are combined with ordinary dyes.

Dyes that can be treated to produce reactive dyes include Naphthalene Dark Green A (C. I. No. 20495), Chlorazol Sky Blue FF (C. I. No. 22311), and Ultralan Orange R (C. I. No. 18870), and many others.

A typical dyeing procedure that will convert an ordinary dye to a reactive one involves padding goods in an aqueous liquor that contains 2% Solochrome Yellow GN, a dispersion of 2% 4:6-dichloro-2-beta-naphthoxy-1:3:5-triazine, 2% sodium bicarbonate, and 5% chromium acetate (which combines with the dye). Liquor pickup should be 100%. The goods are steamed for 5 minutes at 102 C., then thoroughly washed.

The process is applicable to protein, polyamide, and even acetate fibers. An interesting point is that anthraquinone-based dyes that have free amino groups and are susceptible to gasfading are made proof against gasfading when converted to the reactive type. Washfastness is also excellent. Resistance to gasfading is especially important in dyeing acetate-fiber fabrics.

Take an example of a dyeing method of this type: Acetate material is dyed at 80 C. for an hour in a long bath containing tetraminoanthraquinone and a cetyl alcohol-ethylene oxide condensate as a dispersing agent. In a fresh bath the goods are treated at 85 C. with a dispersion of 2:4-dichloro-6-anilino-1:3:5-triazine. The resulting color is aftertreated in a hot soap-and-soda ash bath.

Nylon can be dyed in much the same way by working it in a long dyebath at 95 C. with a dispersion of 2-beta-naphthoxy-4:6-dichloro-1:3:5-triazine. Then in a fresh dyebath the goods are dyed at 85 C. with Duranol Brilliant Blue CB. This dye contains a reactive amino group. The chemical combination between dye and triazine produces a shade with washfastness much superior to conventional dyeing with Duranol Brilliant Blue CB.

The halogenated triazines can be considered to be dye-fixing agents. But there's an important added advantage: Unlike most dye fixatives, the reaction set up between dye and fiber by the halogenated triazines improves washfastness even more than the simple insolubilization of dye brought about by dye fixatives.

You don't have to use water-insoluble halogenated triazines. There are now available a large number of water-soluble halogenated 1:3:5-triazines. Many are based on the reaction of 2:4:6 trihalogen (chlorine or bromine)-1:3:5 triazine with an aromatic primary amine. The reaction is regulated to leave two of the halogen atoms free. Mixtures of such soluble products with a soluble dye in a dyebath will produce the necessary reactive effect on cellulosic fiber.

An example of a water-soluble halogenated triazine is shown in Figure 16 (page 82). This product is based on 1-(2′:4′-chloro-1:3:5-triazylamino)-naphthalene-7-sulfonic acid and 1-(2′:4′-dichloro-1:3:5-triazinylamino)-naphthalene-4:6:8-trisulfonic acid. The former triazine is derived from alpha-naphthyl amine.

PRINTING BENEFITS, TOO

The reactive-dye principle has opened up new possibilities in printing. In fact, they are already well established in printing because of their bright colors and good washfastness.

Early work with goods prepared for printing with caustic and an azoic coupling agent derived from 2:3-hydroxynaphthoic acid gave only poor color yield if reactive dyes were printed on this base. This result came about in spite of adding to the print paste the common acid-fixing agents used to assist fixation of the color. But you can produce stronger colors if you add sodium sulfite, sodium bisulfite, or potassium meta bisulfite to the paste.

You can now prepare goods with, for example, 2-hydroxy-3-naphthoic acid anilide or one of the various Naphthol AS azoic coupling components, and then print on a diazotised primary amine such as ortho-nitraniline, 2:5-dichloroaniline, or 3:3′-dimethoxy-4:4′-diaminobenzene, which will couple with the Naphthol AS component. Then you apply a second print paste that contains a sulfite compound and a reactive dye. Steam the goods. Result: a multicolored pattern of insoluble azoic colors and reactive dyes.

Greater flexibility of color comes from use of the reactive dyes in combination with the azoic dyes. Fastness to washing is excellent.

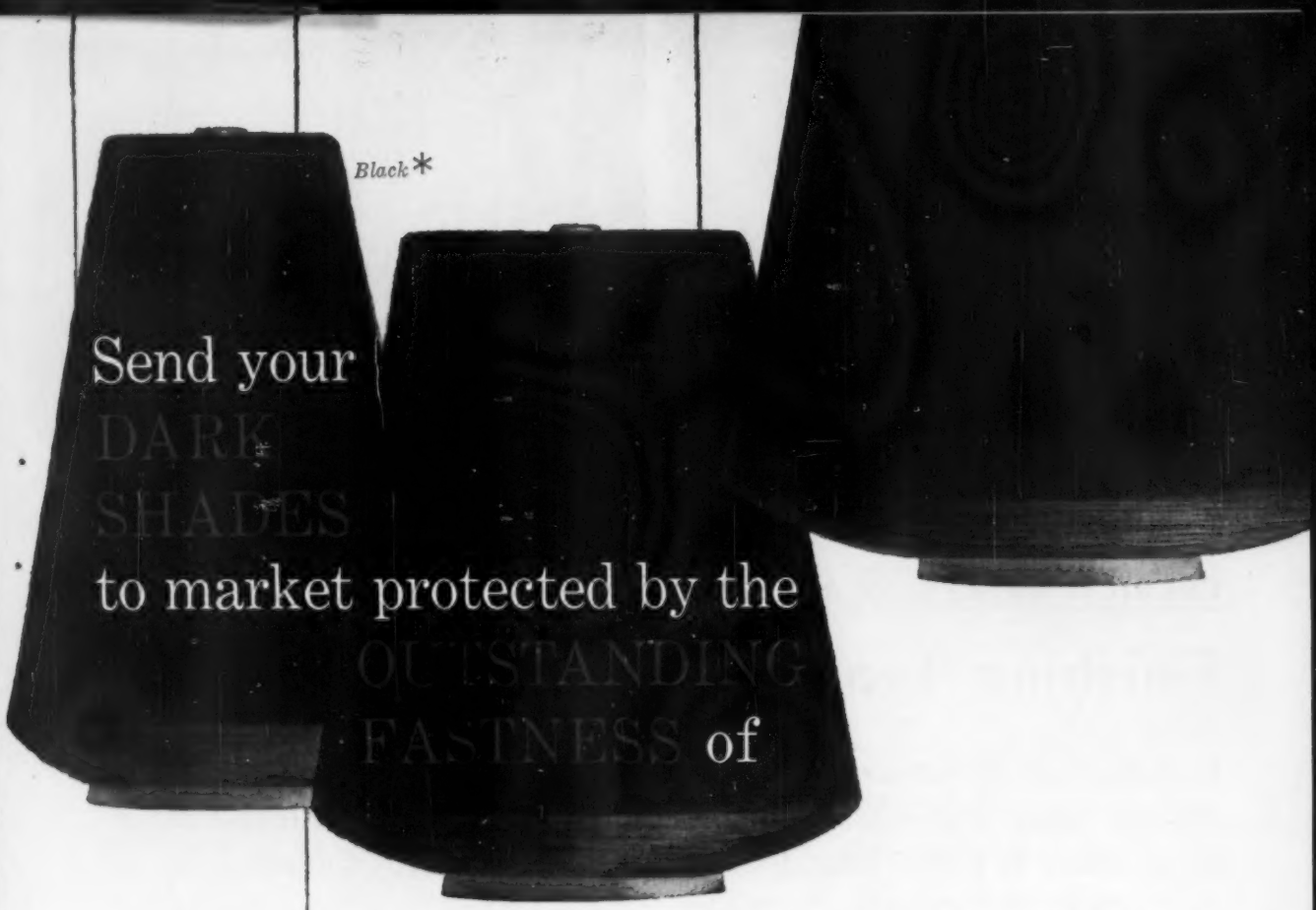
Variations on this idea include the production of resist effects. Goods that have been prepared with, say, Brenthol AS are dried and then printed with a paste containing a reactive dye, potassium sulfite, and urea. The goods are dried and then padded through a solution of Brentamine Fast Blue VB Salt (C. I. No. 37255) plus acetic acid and gum tragacanth thickener. After padding, the goods are can dried (to develop color), soaped and dried. A clear reddish-yellow pattern on a dark blue ground is the result.

NEXT—REACTIVE FINISHES

The research activity that has been inspired by discovery of the reactive principle in dyes is now turning toward development of reactive finishes.

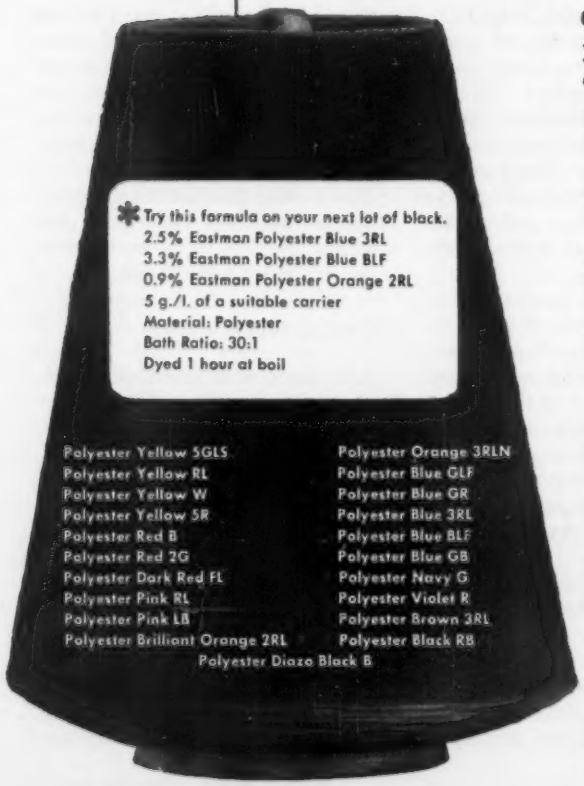
Progress has been made already in water-repellent finishes. Patents issued to the Calico Printers Association in Great Britain reveal that if a higher fatty amine is coupled to a halogeno-1:3:5-triazine reactive group, it is possible to combine the water-repellent fatty residue with cellulosic materials such as cotton. Goods treated with this product retain excellent water repellency through laundering and drycleaning treatments.

In the next few years other durable finishes will be developed to improve the utility of all fabrics.



Send your DARK SHADES to market protected by the OUTSTANDING FASTNESS of

EASTMAN POLYESTER DYES



Call in your Eastman representative to tell you all about the performance advantages and economy of these dyes

Darker shades of polyester fabrics and their blends are more in demand than ever.

In step with this trend, Eastman offers an expanding series of polyester dyes, providing the best all 'round fastness characteristics of polyester dyes currently available.

Specifically developed for use with polyester fibers, these dyes exhibit outstanding fastness to washing, light, sublimation, crocking, perspiration, dry cleaning and wet pressing.

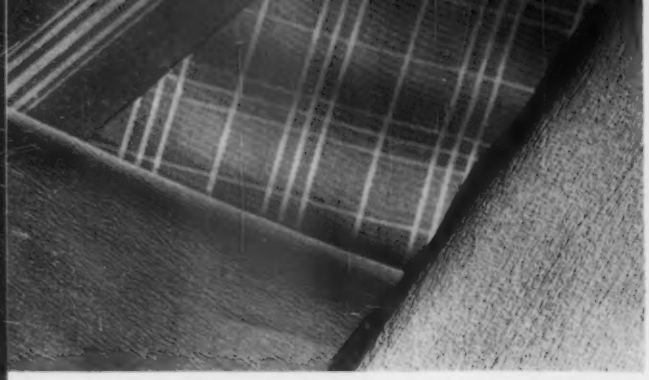
Equally important are their excellent processing characteristics... good build-up, good exhaustion and outstanding leveling properties. Thus, blacks, charcoals, navies and browns are economically obtained.

Dyeing with Eastman Polyester Dyes is easily accomplished with carriers or under pressure at elevated temperatures. Fibers can be readily dyed in tow, tops, stock, or fabric forms. Fabrics of polyester filament can be conveniently dyed in jigs. Fabrics woven of spun polyester yarns alone or blended with cotton, viscose or wool can be easily dyed in dye-becks.

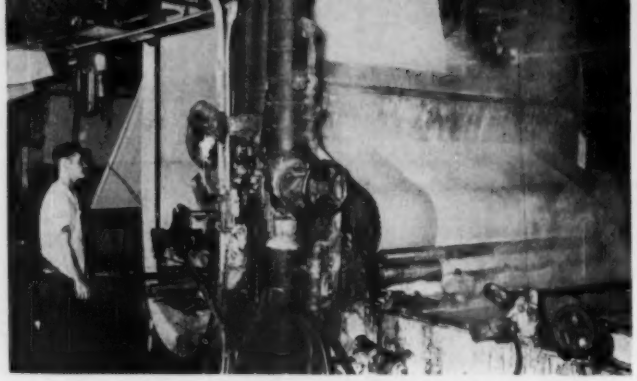
Get the full story of this outstanding line of dyes for polyester fabrics from your Eastman representative.

Eastman Polyester Dyes

Eastman Polyester Dyes are sold in the United States by EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of EASTMAN KODAK COMPANY, in Kingsport, Tennessee; Lodi, New Jersey; and Greensboro, North Carolina. On the West Coast through WILSON & GEO. MEYER & COMPANY, San Francisco, Los Angeles, Portland, Seattle, Salt Lake City. In Canada through CLOUGH DYESTUFF CO., LTD., St. Laurent, P. Q.



TEXTURIZED yarn (Dacron) makes styles like this possible. Heavily creped piece is dyed but not finished material.



BLANKET FEED cuts out tension on goods, provides space for initial shock treatment with hot-water spray.

CHEMICAL TREATMENT & FINISHING

Finishing Top-Quality Textured Crepes

French crepe fabrics are booming again—but today yarns are textured Dacron, nylon, and mixtures of these fibers. Here's how Hellwig Dyeing Corp. draws on almost nine decades of experience for best effects.

THE NEWEST conceptions in women's-wear fabrics are being handled by some of the oldest techniques in the finishing business at Hellwig Dyeing Corp. (Philadelphia) these days. These fabrics (photo, above) are in the category of the French crepes popular a generation ago, which were made of rayon and acetate yarns. Today these goods are based on Dacron and nylon, and blends of these fibers.

"French crepes" today are usually lower-grade rayon or acetate. They do not contain any twist but are merely embossed. Textured fabrics more closely duplicate the silk crepes in hand and appearance.

Variations in construction and finish simulate the Silk Crepe de Chine, Canton Crepe, Crepe Charmeuse, or Crepe Meteor. They are truly wash-and-wear—require no ironing, do not crease in packing. Those fabrics are unique because previous wash-and-wear fabrics were usually flat constructions, while the textured yarns add surface interest.

Hellwig is a commission dyehouse that is equipped to handle yarn or piece goods. Company experience in the handling of expensive silk fabrics goes back many years. In the heyday of silk, work from Hellwig was held up to that of lesser plants as an example of how costly fabrics should be finished.

Hellwig has processed every known natural fiber (silk, cotton and wool) and man-made fiber (acetate, tri-acetate, rayon, acrylic, modacrylic, glass, metallics, polyamide, polyester, modified cellulosics, spandex, and others).

The fabric types processed include industrials, sheer filament to rough spuns, taffetas, crepes, spun blends for women's and men's wear and swim wear. Most of the fabrics intended for women's and men's wear are stabilized and given a crush- and spot-resistant finish.

Add to these sail cloth, draperies, upholstering, typewriter ribbons, and filter fabrics.

Fabrics processed for the armed services include material for parachutes, flying suits, jungle boots, water bags, armor vests, and life rafts—all of which must be dyed and finished to requirements.

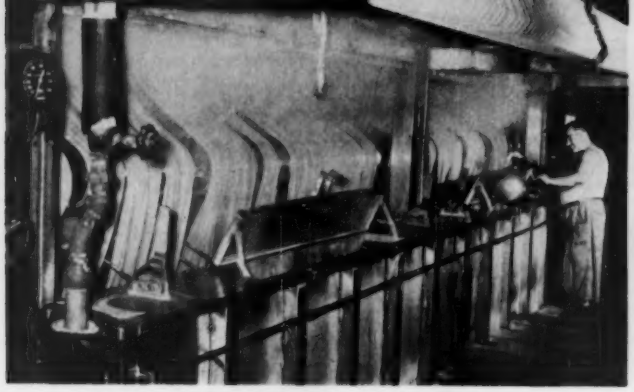
Probably every method of preparation, dyeing, or finishing that is applicable to piece goods has been explored by Hellwig at one time or another. And the choice of routing for a particular fabric is one of the skills built up by seasoned personnel who are familiar with the potentialities of each processing step in relation to the job at hand.

The current demand for modern crepe fabrics finds Hellwig in an excellent position to process them to get the best possible finish.

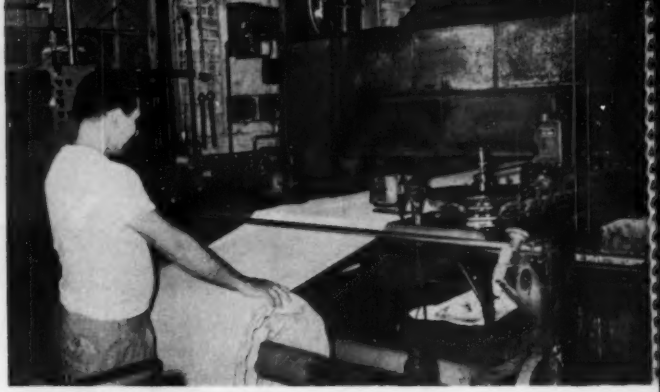
HANDLE WITH CARE

Silk crepes were necessarily solid dyed, but these newer fabrics for dress wear are woven in stripes, checks, and plaids, in color and white, or color and color—yet they have a full crepey hand and all the attributes of polyester fabrics.

These crepe fabrics are made in several constructions and may have texturized yarns in the filling or in both warp and filling. They are designed from 50- and 60-series Dacron so as to take advantage of the different dyeing characteristics of the two types of yarn. They are



THIS 20-FT. BECK plays key role. Covered area at front can receive dyes and dyeing assistants.



STEAMING tenter brings goods (which average 22 to 23 inches in width) out to full width in two or three runs.

not fabrics that can be thrown in a beck, scoured and dyed in one bath, extracted, dried, steamed to width, and packed out.

As with all crepe fabrics, the boil-off method is most important, and has to be selected to suit the type of finish that is wanted. Hellwig may select the Hinnekens machine boil-off as adequate preparation for some styles, but for others Hellwig must use the more laborious and expensive skeined-fabric method.

In the Hinnekens method, the goods are first given a desizing treatment and dropped into a scray large enough to permit sewing-on of one lot to another. From the scray, the goods fall onto an endless blanket that is drenched with warm or hot water according to the crepe effect that is necessary.

Water temperature at this point can be critical. Hellwig isn't giving precise figures here—but in the body of the machine, boil-off temperature runs 190 to 200 F. Boil-off ingredients include a detergent and alkali. Normally, the Hinnekens operation takes 20 to 30 minutes, and the goods are delivered, rinsed, cooled, and loaded on trucks that take them to the dyeing machines.

SOME GET SKEIN BOIL-OFF

Some styles, particularly those with texturized yarn in the filling only, are better boiled off in skein form. The pieces are wound on open-ended hanking or skeining machines—the terminology varies with the area—and one stick is placed in the loop of goods. Each piece is handled separately. When the lot is made up, it moves to the boil-off tubs and submerges in the boil-off liquor. The pieces are lifted up frequently on the sticks, and the bearing area is shifted so that crepeing is even. The crepes based on plastic fibers like Dacron or nylon behave somewhat differently from the old rayon or silk crepes. In the latter, particularly rayon, boil-off procedures were designed to give total shock and maximum crepeing within seconds. With the plastic yarn crepes, shock is important but the time element has more effect.

BECK DYEING

Modern stainless-steel becks are used to dye the Dacron crepes. The dyeing methods vary according to the style. Dacron of the 50 series is dyeable with disperse colors, and heavy shades will require 5 to 8 hours at 204 to 208 F. Dacron of the 60 series will accept either disperse or cationic dyes, and both 50- and 60-series types are often included in a fabric so that cross-dyed effects can be produced.

Hellwig uses the carrier method to dye either type of Dacron, and chooses from proprietary compounds to suit the dyes, the shade, and end-use requirements. Carriers that are in current use include Latyl Carrier A (Du Pont), Tanoval (Tanatex), Palanil (Putnam), and Carolid (Tanatex).

In a typical routine, the boiled-off crepes are loaded in the beck and the bath is set at 160 F. with a small amount of surface-active agent plus 3 grams per liter of ammonium sulfate and from 5 to 8 grams per liter of Latyl Carrier A. The well-dispersed dye is added after a 10-minute period, and the bath is brought to the boil.

Only covered equipment is suitable to maintain the high temperatures necessary to dye either type of Dacron with disperse or cationic colors. Dyeing with the cationic dyes is the same, but at pH 5.0.

The goods are scoured to remove trances of carrier, and after rinsing may be given a softener before they are prepared for finishing.

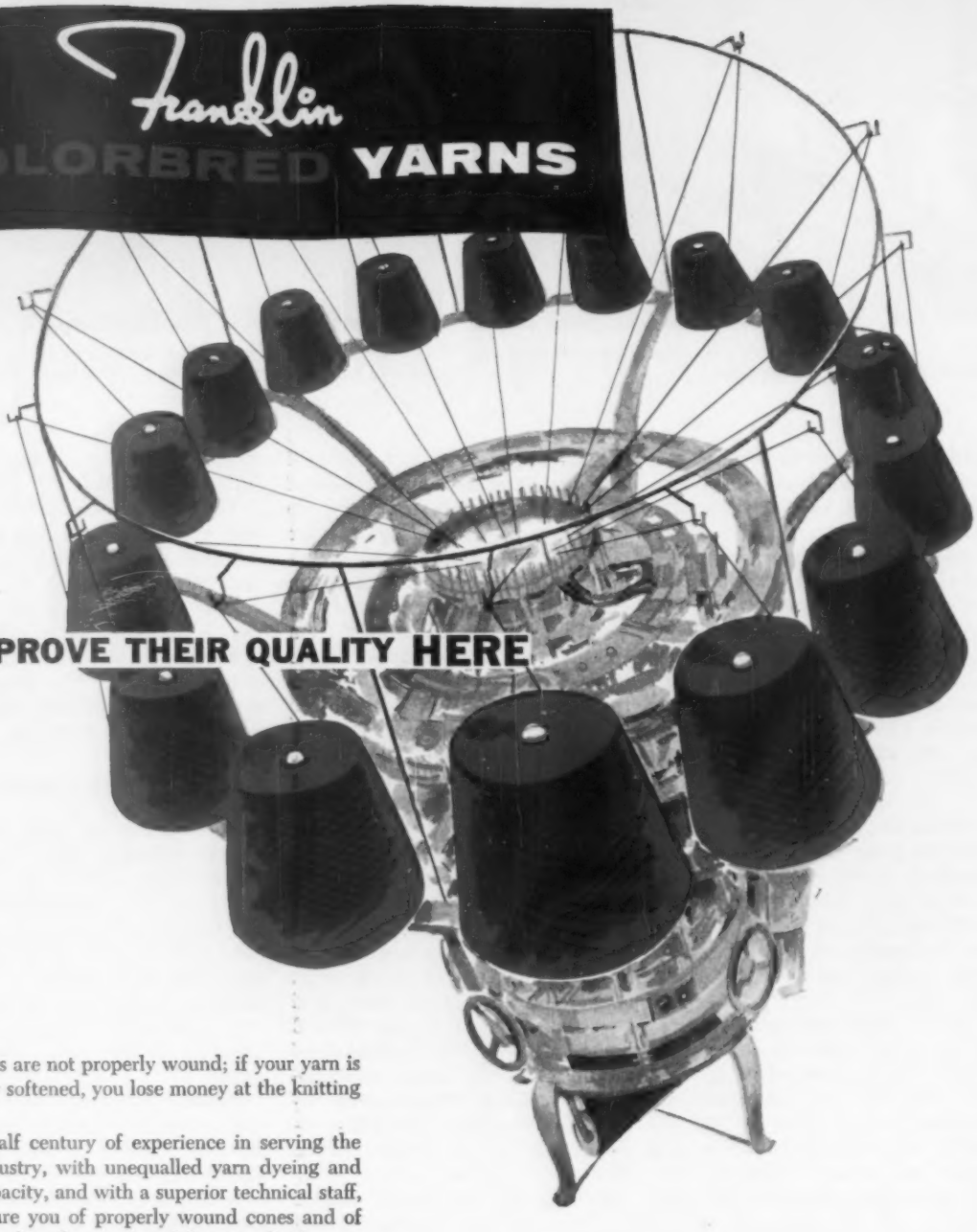
FINISHING THE GOODS

The dyed goods may be dried on any of several machines, including an Airlay, a looper, a tenter, or a Palmer unit. The initial drying, like the boil-off method, is going to have a lot to do with the final finished effect—particularly surface interest. In the main, these fabrics are dried slack and taken to the tenter for pulling out to width with steam.

Because the hydrophobic fibers don't respond to moisture as fast as rayon or silk, the framing to width usually requires two or three runs to ease the goods out to width. Final development of hand, width, and surface is done on a pad-tenter range with a gas-fired heat booster that makes heat-setting possible in the same run.

The goods are finished with a durable antistatic material and are heat set at 340 to 390 F., according to yarn type, tenter speed, and fabric weight. At this point, width and crepe have been established. The final touch may be a run through a conventional three-bowl silk calender or semidecating to produce the mellow, fluffy hand that is characteristic of the latter process.

Franklin COLORBRED YARNS



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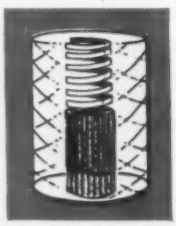
And don't overlook the quality of Franklin Dyeing. Wound on Franklin Springs exclusively, our dye packages are compressible. Soft packages compress more and hard packages compress less into a column of uniform density. Uniform penetration of dye liquor and uniform shades consistently follow.



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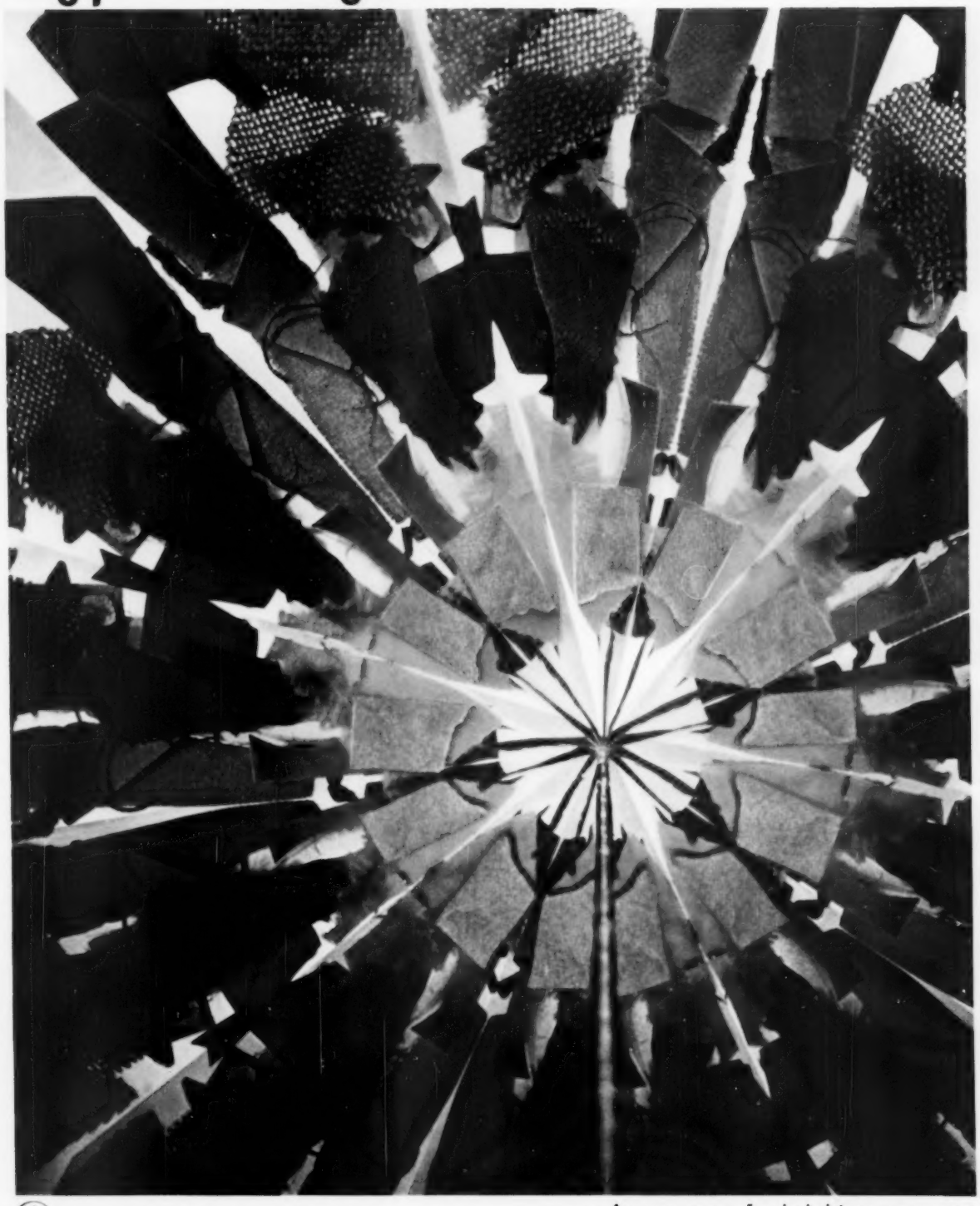

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Nopcosize D	Water-soluble polymeric size developed for slashing Dacron* filament yarns
Nopco 1111	Plasticizer and lubricant for rayon and acetate sizes. Also used extensively in the soaking of rayon crepe yarns
Nopco 1440	Warp size bath additive that acts as a plasticizer, lubricant and penetrant for rayon and acetate sizes
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*Trademark of E. I. du Pont de Nemours & Co., Inc.

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This low-cost decorative spraying technique with Geon vinyl offers design opportunities for other types of materials as well. Full information is available. Write Dept. PF-1, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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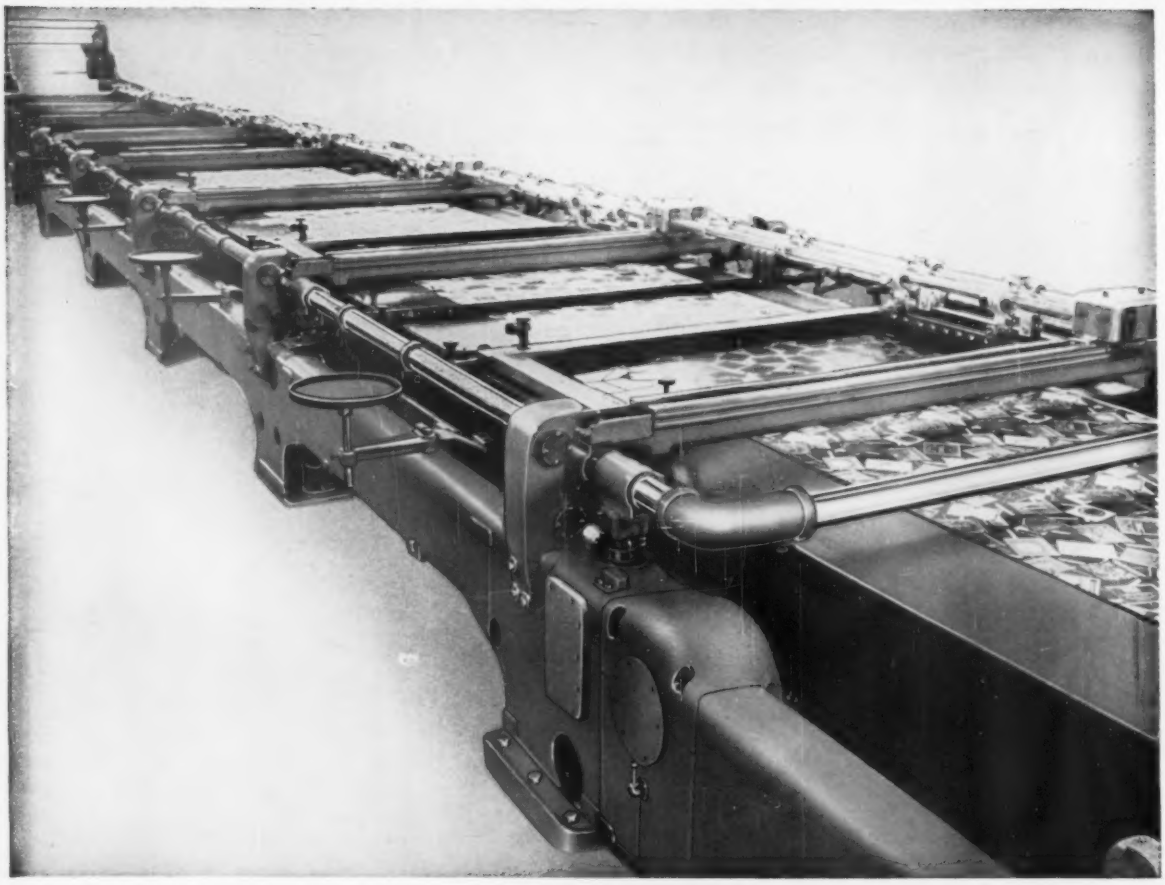

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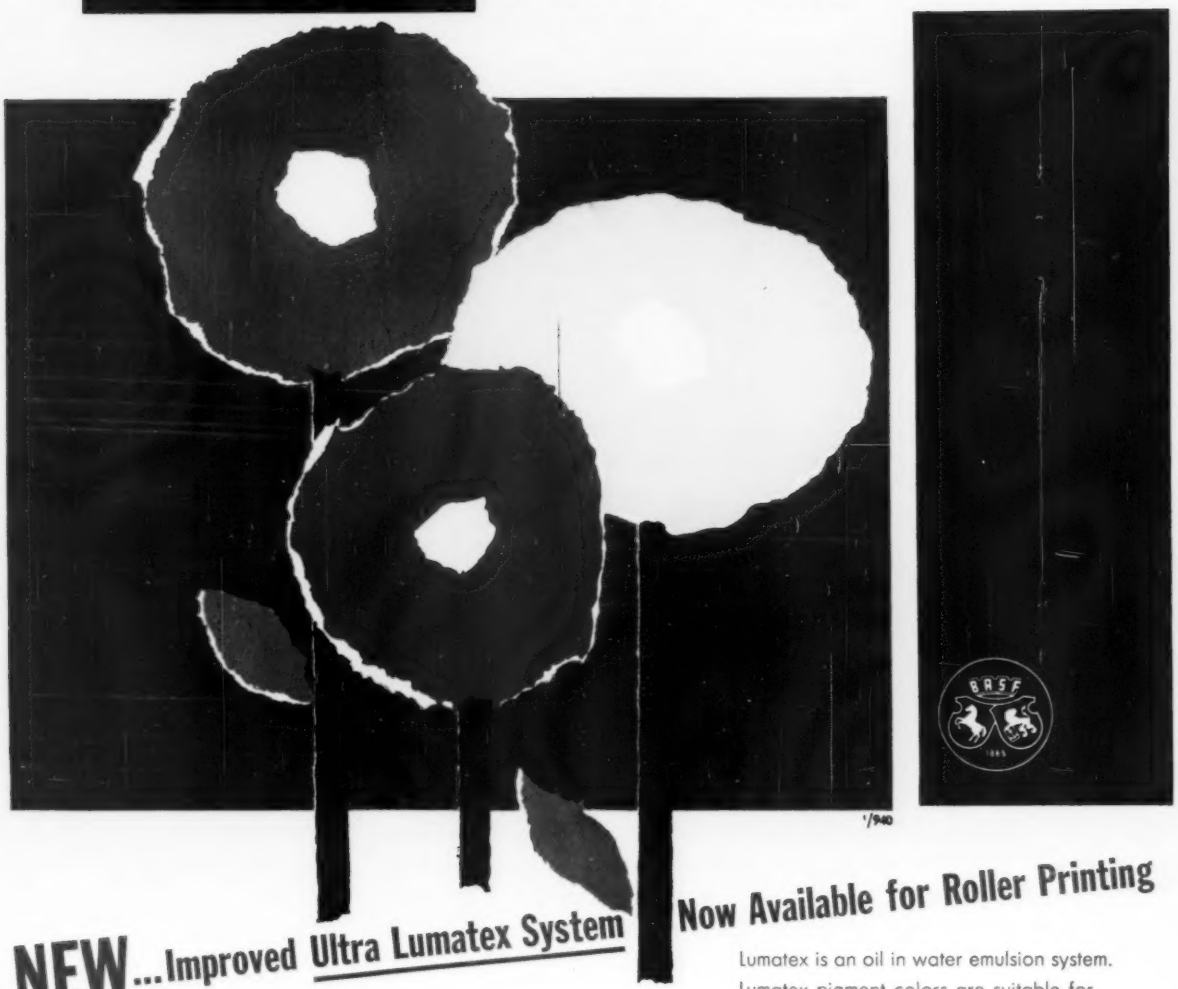

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TEXTILE WORLD... News from the Mills

Avondale Mills, Inc., Sylacauga, Ala., has opened its new plant in Olanta, S. C. The plant is entirely equipped with Willcox & Gibbs and Pfaff sewing machines.

Bates Mfg. Co., Edwards Div., Augusta, Me., has bought six new Model M6A Even-Draft drawing frames.

Bemis Bag Co., St. Louis, Mo., has acquired a substantial interest in Systemation Corp., a St. Louis area firm that specializes in the development of integrated and automated packaging systems and machinery.

Burlington Industries, Inc., Greensboro, N. C., is negotiating with Whitin Machine Works, Whitinsville, Mass., for the purchase of 97 spinning frames at a cost of about $30 a spindle, according to trade reports. Burlington has also formed a new company known as Burlington-Balfour Mills to handle men's and children's hosiery-manufacturing and sales functions.

Carolina Elastic Corp., Mount Airy, N. C., a new company only 18 months old, has just completed a $25,000 building and plans to double production within the next few months. The company will also spend $20,000 for additional machinery for the expansion.

Carolina Mills, Inc., Newton, N. C., has bought 100 new 44-in. Draper shuttleless looms.

Cherokee Textile Mills, Sevierville, Tenn., has ordered six Model N spinning frames from Whitin Machine Works, Whitinsville, Mass.

Delta Thread Co., Nashville, Tenn., has made plans for a new expansion that will represent more than $1-million investment. The new structure will be about 34,000 square feet and will cost about $200,000.

French Worsted Co., Woonsocket, R. I., has ordered one 72-spindle Model ASW4 roving frame and six Piedmont Model KW, 240-spindle, American-system spinning frames from Whitin Machine Works, Whitinsville, Mass.

Hazlehurst Mills, Hazlehurst, Ga., is building a 35,000-sq.-ft. addition. The laboratory of the existing mill has recently been doubled in size and new equipment has been added.

Hillsboro Enterprises has bought a half interest in Tennessee Tufting Co., Nashville, Tenn.

A. & M. Karagheusian, Inc., Freehold, N. J., has made plans to consolidate the manufacture of broadloom-wilton carpet now made in Freehold, N. J., with the company's velvet operations in Aberdeen, N. C.

Kayser-Roth Corp., New York, N. Y., has—through its wholly owned subsidiary, Apparel Industries, Inc.—acquired A. Stein & Co. The company has also purchased Cole of California, Inc., Los Angeles, Calif.

The Kendall Co., Boston, Mass., has made plans to consolidate all general and top-level managerial functions of its textile division in a new $750,000 headquarters at Charlotte, N. C. The building, to be completed in March, is on a 50-acre tract. Also housed in the building will be the research department. The company has also announced an expansion program to cost about $1-million at the company's finishing plan at Bethune, S. C.

Mauney Mills, Inc., Kings Mountain, N. C., has ordered a Model M Even-Draft drawing frame, a Model H1 Super Lap Machine, four Model J combers, a Long-Draft roving frame (10x5) and twelve Model N standard spinning frames.

Morganton Finishing Co., Salem, N. C., is the name of a project for a $400,000 industrial plant that will house a New England textile finishing corporation. The new 80,-000-sq.-ft. plant will be built on a 10-acre site.

Ponemah Mills, Taftsville, Conn., has sold 260 Draper X-2 looms. The company will concentrate on weaving man-made-fiber fabrics.

Owenby Mfg. Co. of North Carolina, Inc., Andrews, N. C., has purchased the Andrews Textile Building which it has leased from a group of local citizens for the past five years. The property, valued at over $75,000, consists of an 80x150-ft. building and a 50x100-ft. addition which was built by Owenby.

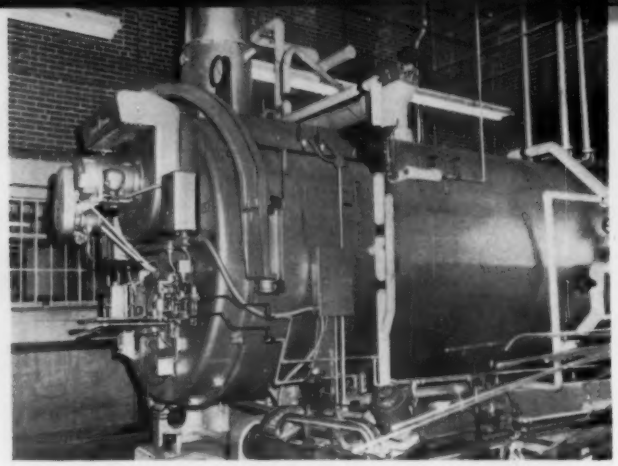
Slater Bros., Inc., Paterson, N. J., has moved its operations to Kings Mountain, N. C., and consolidated its business there.

Springs Cotton Mills, Lancaster S. C., is in the midst of another $5-million expansion. The White Plant's $2-million addition will be completed in January. The company has also ordered 115 wide Draper XP-2 looms costing in excess of $300,000. In New York City, Springs has purchased the land at 104 West 40th St., running through to 39th St., and plans a building on the site as its New York sales headquarters.

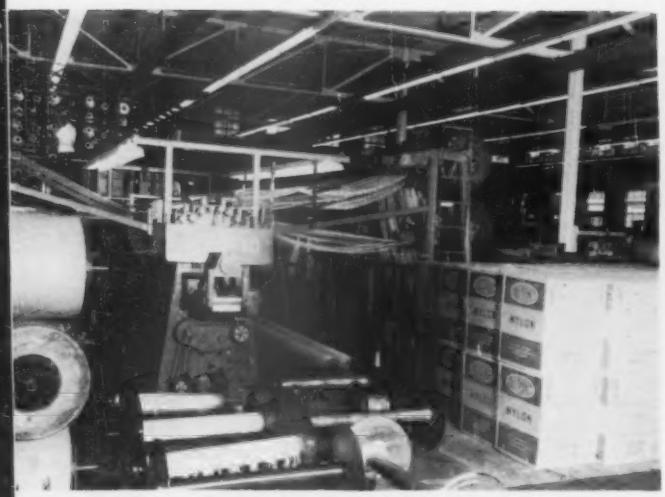
J. P. Stevens & Co., Inc., Greensboro, N. C., has announced the formation of Computer Business Forms Co., for the manufacture and sale of business forms in the Greensboro area. J. P. Stevens has signed purchase agreements with Whitin Machine Works, Whitinsville, Mass., covering the installation of 96 new Model N standard spinning frames as part of the mill-modernization program being undertaken at the company's Whitmire plant in Whitmire, S. C.

West Point Mfg. Co., Anderson, S. C., is nearing completion of a modernization program which includes construction of a two-story addition, relocation of machinery, and installation of 26 new spinning frames at its Wellington Mill. The over-all project will cost more than $870,000, and 21,000 square feet will be added.

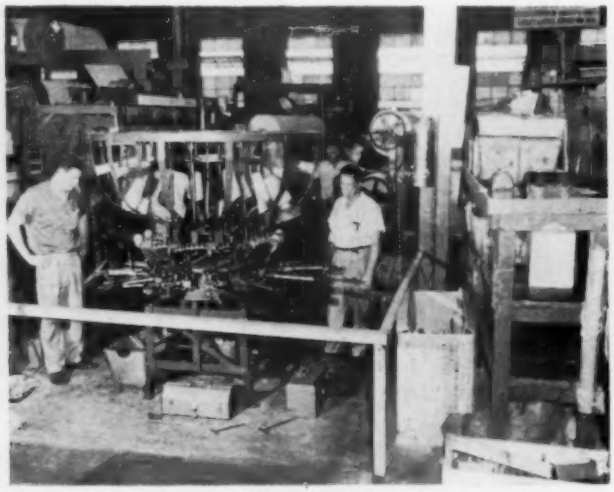
BOILER HOUSE is new. It fits snugly into the main body of the building. Only three walls had to be built. The load-bearing end wall is 12 inches thick; the two side walls, 8 inches thick. All walls are solid brick.



BOILER supplies 35,000 pounds of steam per hour for heating and finishing. Packaged 600-hp. oil-fired unit receives water from an overhead feed-water deaerator heater. There's room for a second boiler.



KNITTING machine, also brand-new, further broadens Wunda Weve's manufacturing methods and the possibilities for new designs. All yarns (backing, chain, and pile) are fed from beams at both the front and back of the machine.



RADIAL QUILLER is one of three being added to streamline weaving operations. Bobbins fill rapidly at 10,000-rpm. spindle speed. Crowded floor will be opened up as soon as all machines are positioned, and old machines removed.

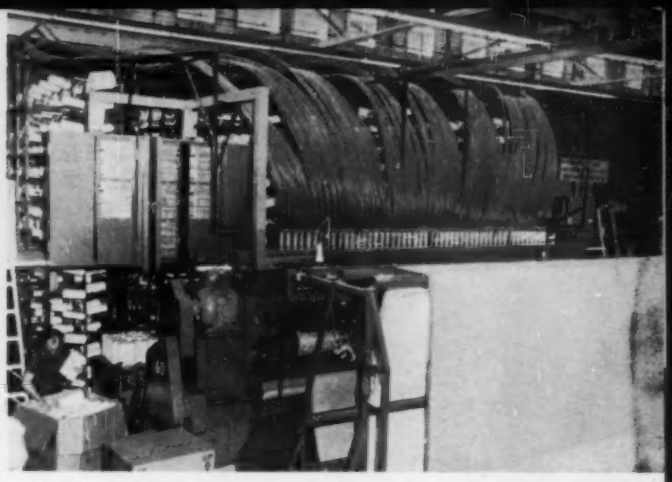
Good Way to Spend $1½-Million

That's the sum earmarked for expansion at this well-known carpet mill. The money isn't just for machines. New mill facilities, service equipment, and an expanded staff are accounting for a big chunk of the total.

THINGS ARE all astir these days at Wunda Weve Carpet Co., Greenville, S. C., where $1½-million is being spent on expansion. Look at the new tufting and knitting machines or automatic quiller in the photographs above and on following pages and you'll see a state of high activity—maybe even confusion at the moment.

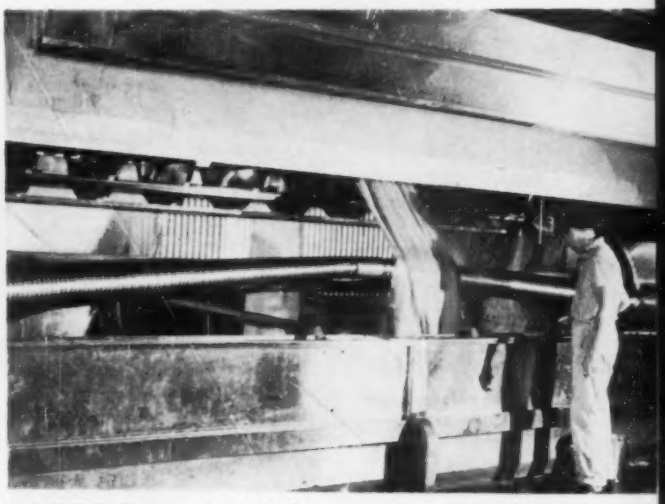
Fact is, things really are popping at Wunda Weve. For the past 14 years the company has specialized in woven carpets. But now all three principal types of carpets are being

STORAGE capacity for yarn is increased with new storage racks and an electric lift truck. Now all floor space from floor to ceiling is used gainfully. Yarns stored are cotton in many yarn numbers and plies, plus jute, wool, and nylon.



TUFTING machine is newest machine in the mill—and Wunda Weve's first tufting equipment. Individual-end control from scroll pattern provides new design possibilities that are being increased with the newer nylon carpet yarns.

WORKSHOP at the mill designs and builds all displays for customers and for shows of company's products. One of the newest displays, built in this shop, is Wunda Weve's "Flower Show of Colors," showing the state flowers of all 50 states.



LATEST TRICK in dyeing 15-ft. nylon tufted carpets is to handle them in rope form. Rope marks do not develop, and side-to-center and side-to-side shading are eliminated. Good example of the ingenious ways Wunda Weve solves problems.

manufactured: woven, tufted, and knitted.

That doesn't mean woven carpets are being de-emphasized. Fact is, three new broadlooms are being installed as part of the mill's expansion program.

Where is Wunda Weve getting space for its new equipment? That's where the first part of the $1½-million is going. The first building completed is a 6,000-sq.-ft. addition for a specially designed boiler and supplementary steam-producing equipment for expanded custom dyeing and for carpet finishing.

What's more, a second building with 5,000 square feet has increased the floor space for new dyeing equipment. And there's more to come. The front of the present weave room will be extended by 40,000 square feet. Completion is scheduled for this year. This new space will be used for additional offices for the company's accounting, sales service, and production personnel.

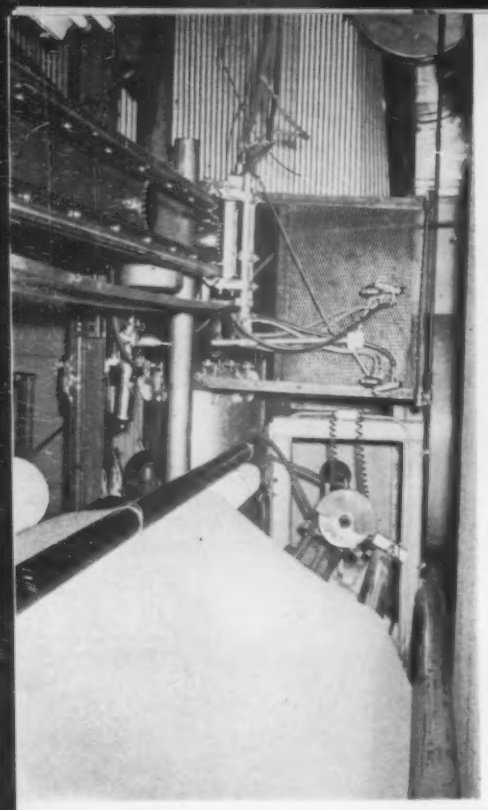
NO LOST TIME

Immediately following this building project will be a 30,000-sq.-ft. addition to expand manufacturing space in the principal carpet-weaving areas. This intermittent construction development was planned so that there would be no interruption of production schedules.

Inside the plant and already in place is the first of the company's modern tufting and knitting machines designed to Wunda Weve's specifications. Alongside, there's new auxiliary equipment such as Abbott radial filling winders. Expansion of other facilities already completed includes a new warehouse-storage system and a new yarn-storage area.

Much of the $1½-million being spent is going into a larger inventory of carpets so that customers won't have time to wait.

. . . Turn the page



SPRAY HEADS, four of them mounted on a reciprocating carriage, spray antistatic finish on the face of rugs as they pass through the roller coater that applies latex to back of carpeting.

GOOD WAY

. . . *Begins on page* 98

NEW MEN EVERYWHERE

That's the inside story at Wunda Weve on building and machines. But outside the production area of Wunda Weve's expansion program there's a third dimension—an increase in management men in production, research, and sales.

A new product-development department has been established with a manager, assistant manager, and special production assistant. There's also a new director of design and color styling, who functions within the product-development department. Two new industrial engineers have been added. For the new knitting and tufting machines, a special mechanical technician has been hired.

To expand sales and thus absorb the increased production, a division sales manager has been promoted to a brand-new position of national sales-promotion manager.

The former public-relations director has been appointed advertising manager in addition to public-relations duties. Within this department, there's a position of director of information services.

Another new man is the director of personnel relations. He'll smooth tempers, eliminate possible friction between departments. But his greatest plans are in being sure the right future employees get on the job. He's gathering no end of aptitude-testing equipment, and he has the ideas to use this equipment successfully. He'll be busy working with well over 300 plant employees.

That's why Wunda Weve is ready to move with its new buildings, machines, and equipment. It has set up three phases of operation: production men to run the equipment, research men to develop new products, and a sales organization to sell the output.

What success is in immediate sight? Listen to Wunda Weve men tell their own story:

COMING: DIVERSITY

Here's what President W. W. Pate, Sr., sees: "We've grown steadily since we were organized in 1946, and now we're the nation's largest producer of cotton carpets. But in recent years we've also specialized in nylon and wool carpets. The present addition of tufting and knitting machines gives us machinery to make several distinct types that have not been possible previously.

"But most important—our new creative and skilled people will enable us to develop and market some of the newest man-made fibers, principally continuous-filament nylon.

"Increased dyeing facilities, and skills inherent in this expansion program, will allow us to improve our position further as producers of colorful carpets."

EQUIPMENT: FIRST RATE

Operations Manager R. W. Pierce says: "Here's how we stack up mechanically with our new production machinery. Our first tufting machine is a Cobble Bros. Model CB-5000, 216-in., $\frac{5}{16}$-in.-gage, yardage machine with a scroll-type pattern attachment with single-end control for making 15-ft. carpets.

"The double-deck creel holds 10-lb. packages of continuous-filament-nylon yarn for pigtail creeling of 1,200 yarn ends at the machine. Principal yarns tufted to date are DuPont 501 carpet nylon and Chemstrand Cumuloft. We've also run some natural yarns.

"Speed is 550 stitches per minute (rpm). The two motors are 10 horsepower each. At optimum efficiency we expect an output of 20 to 25 rolls of 100 feet each per shift. Operators are two creel hands, one machine operator, and one inspector. Date of installation was June 27, and erection time was three weeks.

"Knitting machine is a Model F Kidde machine for 15-ft. carpets. It's for smooth-surface, loop-pile carpets. Pile yarns, backing yarns, and chain yarns are fed from warp beams. Jute backing yarn is 1s, cotton chain yarn is 8/3, and pile yarn is Du Pont 501 nylon in most carpets we've knitted to date. Speed is 165 rpm., and maximum production is six to eight 100-yd. rolls per shift. Main operator is one knitter. We haven't fully established warp-replacement methods and employees needed yet.

"We're impressed with one important feature of the knitting machine—cost of yarn used. All costly face yarns remain on the face of the carpet and are actually locked into the back.

"Both tufting and knitting machines are under the supervision of our new tufting technician, and he is training operators and fixers. Date of installation was May 25th, and the machine was running within two weeks.

"Woven carpets are our long suit, and we've expanded output by adding three new looms. In the past we've always designed our own looms and have had most of them made in local machine shop. But this time we both designed and manufactured the looms in our own plant. The only outside work done was in having castings made.

"Two of the new looms are 15 feet wide, and one is 12 feet. In over-all design, these looms are much like our other looms. But

major parts have been strengthened and improved to require less maintenance. And they're constructed more heavily throughout.

"Loom speed of the 15-ft. loom is 64 ppm., the same as on our other 15-ft. looms [TEXTILE WORLD, Nov. '55, p. 110]. But as we're weaving two rolls of carpet at once one each loom (conventional cut pile), output is actually 128 ppm."

AHEAD: NEW IDEAS

Product Development Manager Edward J. Doyle says: "Our job in the new product-development department is to gather new ideas for carpet fabrics and to interpret them into fabrics that fit into Wunda Weve's manufacturing scheme.

"The ideas may be our own, those of our salesmen, or even those of our customers. The manufacturing scheme includes production, selling, and promoting. Certainly, every fabric has to be evaluated as to its acceptability by our market.

"We often start with a new yarn or particular type of existing yarn. Then we visualize this yarn in terms of need in the end use. We determine whether it can be produced into a carpet best by knitting machine, tufting machine, or loom.

"Then we have to figure a retail price bracket for the carpet—a bracket acceptable by our customers. Then we revise many times, maybe for a hundred reasons. If a new carpet version looks good productively, and in price and sales, we've really just begun. Performance must be proved. One man in our department is in charge of testing. That's his job, and that's all he does.

"Our efforts are correlated with those of outside people—yarn manufacturers and national magazines, for example. Our two main facets are performance of product and quality of product. Working together we are successful in reaching our goal.

"We also evaluate all fibers on the market for possibilities. There are great possibilities in natural fibers, man-made fibers, blends of man-made fibers, and blends of natural and man-made fibers. We will research every fiber that's made available to us.

"We think our research and product development is on a practical level. It's applied research dealing with known things. And we're looking forward to a quick payoff."

IN DESIGN: SOMETHING NEW

Designer Walter Cullars sees the immediate future like this: "Soon we'll be producing color, pattern, and texture effects never before achieved. Dimension dyeing is producing a true clustering of compatible colors in all our carpets. The customer often dictates the color, and we dye a carpet to match anything—a treasured object d'art, a prized painting, a fabric, or a wallpaper swatch.

"New equipment in our custom-dyeing and finishing departments is helping us achieve these results..

"A new Rodney Hunt dyebeck that will handle 15-ft. carpeting has been installed at a cost of $22,000. The Birch Bros. pad that is used to remove excess water from the dyed rugs has been moved into a new 6,000-sq.-ft. addition.

"The roller-coating and drying range has been revamped to provide more heat and greater air flow. Productive capacity has been increased 35 to 40% at a cost of over $10,000.

"Better end-use quality is being added to the finished nylon rugs now by a Binks spraying apparatus. With this oscillating unit, two spray heads shoot an antistatic finish onto the face of the goods as they pass through the roller coater and drying range. This addition represents a $3,000 investment but requires little or no attention when it is running.

"We're installing a hot-water heating system to speed up the dyeing process. A 7,500-gal. storage tank will supply hot water at 110 to 120 F. for the dyehouse.

"Heat will be supplied by the plant's boiler system, recently augmented by a Cleaver-Brooks oil-fired unit that is rated at 35,000 pounds of steam per hour. Two older Kewanie and one Ames boiler were pushed to total 25,000 pounds per hour."

What's New at Wunda Weve, What It Cost

Building

Boiler house. 35 x 35 ft. (1,225 sq. ft.) $44,500.
Finishing plant extension. 35 x 124 ft. (5,000 sq. ft.) $53,000.
Offices for production areas. $5,000.
Employees' parking lot. $6,000.

Service Equipment

Water main (6-in. dia.) from highway to plant. $2,000.
Steam main from boiler house to dyehouse (8-in. dia.) $2,500.
Hot-water storage system for dyehouse. $10,000.
Feed-water deaerator heater. $4,500.
Boiler. $21,000.
Warehouse storage system with racks and electric lift truck. $30,000.
Tube storage with fork lift truck. $22,000.

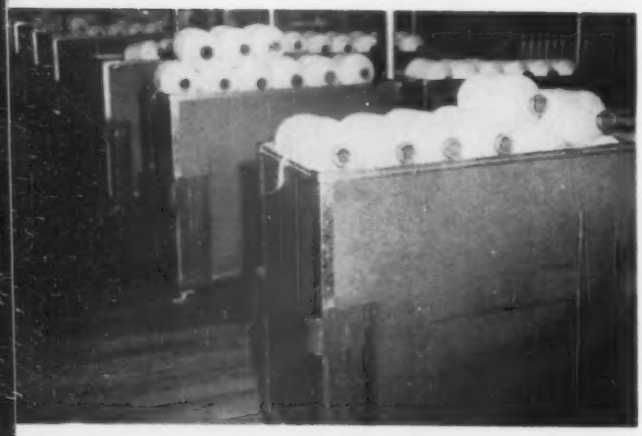
Machinery

Installed knitting machine. $50,000.
Installed tufting machine. $70,000.
Three automatic quiller. $14,000.
Three looms, installed. $55,000.
Dyebeck. $22,000.
Roller coating and drying improvements. $10,000.
Antistatic spraying apparatus. $3,000.

Coming Additions

Front extension for warehouse and offices. 40,000 sq.ft. $250,000.
Side extension for manufacturing. 30,000 sq.ft. $160,000.

TEXTILE WORLD . . . COST CUTTERS



Doff Box Cuts Handling Time

Special doff boxes that can be used at roving, spinning, and winding are saving time and money for Carolina Mills, Inc., Maiden, N. C. Time studies show that these boxes have cut creeling and handling time 20%. Bobbins are no longer dumped from small to large boxes and vice versa. This, plus reduced handling, results in less damaged roving and yarn.

Designed by the mill and manufactured by Sunray Co., Spartanburg, S. C., each box holds 24 bobbins of 13½x7 roving (or a complete doff from both sides of a spinning frame). The box has a spring bottom that lifts the bobbins higher as each layer is removed. A small clip-on container holds empty spinning bobbins. When a spinning frame is doffed, the box is pushed a short distance to the winders.

New Pickers Save Time and Money

Virginia Mills, Inc., Swepsonville, N. C., is converting all box looms to polyethylene pickers. Results indicate longer-wear life, lower picker cost per year.

General Superintendent W. B. Younger says these pickers have been in use for six months, with few replacements being required. When using leather pickers on upholstery looms, replacements were required every 4 to 8 weeks. Subsequently the replacement rate using polyethylene pickers has been cut from ⅓ to ⅙. The polyethylene pickers cost about twice as much as leather. However, Virginia expects that the average annual cost will be 50 to 66% of the amount previously paid for leather pickers.

Virginia Mills also has Draper XD looms, but its plans do not call for these new pickers on them.

Inspecting by Assembly Line

Assembly-line inspection and trimming of sweaters and other knitgoods are now the practice at Herbert Mills Co., Inc., Marion, S. C.

An inspection form encircles a 15- and 20-amp. fluorescent tube, which gives off no glare. An inspector pulls a garment over this form and trims and inspects it as she swivels the form on its base. Inspection is done by order in bundles of two dozen.

The inspector then tosses the garments onto a conveyor, which carries them to the pressing room.

The conveyor belt, which is 2 feet wide and 100 feet long, travels at 55 fpm.

Inspection stations are 6 feet apart all down one side of the conveyor. If production is increased, stations can be added along the opposite side.

Loom Lubrication at 2,000 Ppm.

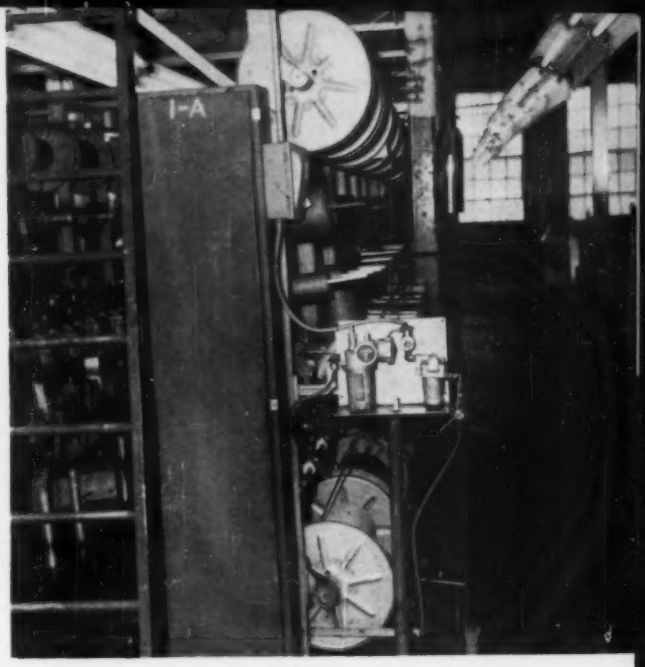
High-speed needle looms for narrow fabrics at Bridgeport Fabrics, Davidson, N. C., run 2,000 ppm.

All of the loom cams and auxiliary motions for harness movement are in an enclosed case. Oil must be positively fed to every moving part in the case to prevent wear.

On zipper tape 3/8 to 9/16 inches wide, for instance, the looms formerly had to be oiled by hand every 24 hours to prevent wear to the precision-made parts.

Bridgeport completely eliminated this oiling by adding a centralized lubrication system (Alemite Div., Stewart-Warner Corp.) to the looms. Looms are mounted in banks of 10, and each unit lubricates all 10 looms.

Results: Wear is reduced, manual oiling eliminated.

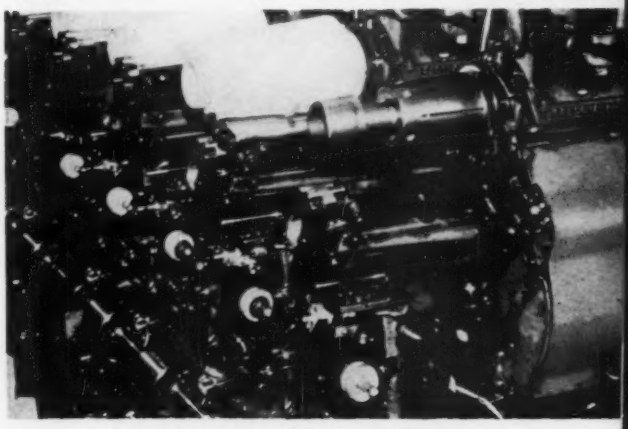


Tensioning Improves Cone Quality

Uneven tension on yarn cones can cause rejects to be as high as 40%. But Kayser-Roth Inc., Burlington, N. C., recently installed an electromagnetic tension control that reduced rejects to about 10%.

The tension unit, called Una-Mag, consists of two metal discs drawn together by an electromagnet. Used on a Universal No. 50 winder, the unit replaces a gate tension that had 18 contact surfaces. Tension on the Una-Mag is adjusted by a single potentiometer knob. And up to 200 units are controlled from one potentiometer. This puts a constant and equal tension on each cone.

With even tension and less contact surface Kayser-Roth has minimized yarn packaging problems—such as dye streaks, scuffing, strip backs, and uneven cones.



Now It's 4,160 v. in the Plant

When underwriters "forbid" 4,160-v., floor-level transformer installation in process areas, do what P. H. Hanes Knitting Co., Winston-Salem, N. C., does—hang your transformers high on the wall adjacent to your process requirement. This way you can minimize voltage drop, save floor space, and reduce copper costs.

Hanes brings 4,160-v. power from substation breakers to the plant building by direct buried cable. Interlocked armored cable runs through the building to step-down transformers. These transformers are Y-connected to provide 480, 440, 240, 220, 208, 120, and 110 v. for various manufacturing operations and 277 v. for series lighting of fluorescent lamps. Breakers next to transformers are rated at 30 to 75 amps.

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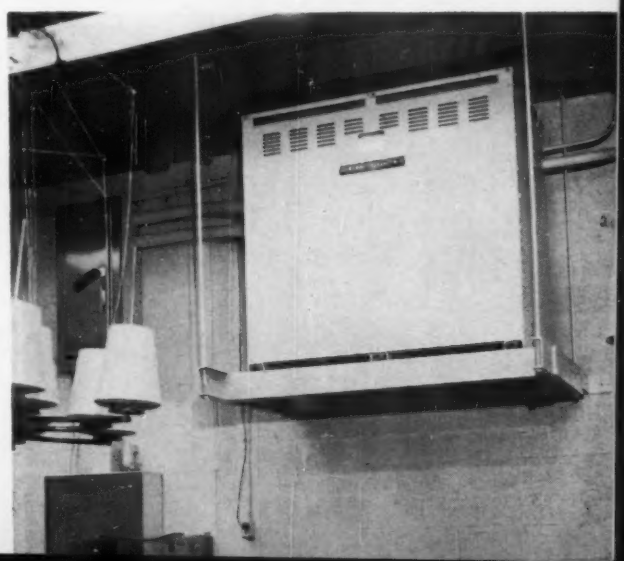


Electric Truck Speeds Yarn Hauling

American Thread Co.'s Dalton, Ga., plant has cut manual handling time 50% by using an electric Moto Truc to haul yarn packages from the twisters to the winding department. One battery last 8 hours.

Yarn is doffed from the twisters directly onto pin boards that hold 24 bobbins each. Twenty of the boards are stacked on the body of the truck. Each bobbin weighs 24 ounces, so that total weight moved amounts to 720 pounds per load.

Pin boards loaded with yarn are placed on a special creel at the winder. This creel, made of lightweight angle iron, is used in place of the conventional trough.

Empty bobbins from the winder (photo) are doffed directly onto the pin boards, which are again placed on the Moto Truc and returned to the twister room.

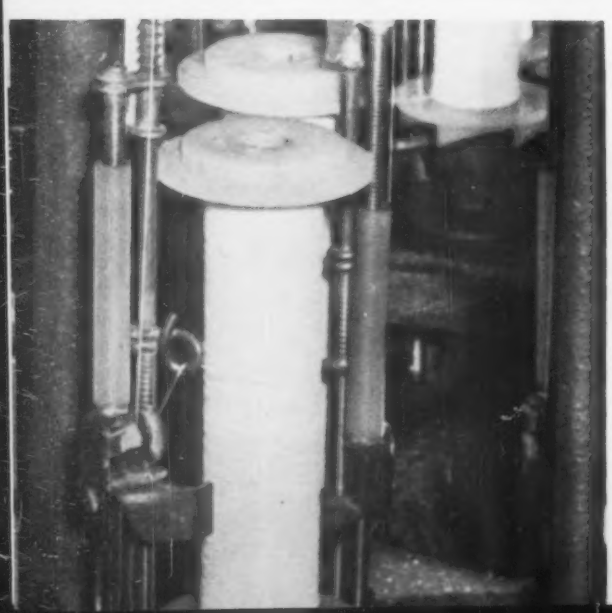
Collapsible Containers Cut Shipping Costs

If you have an intraplant hauling problem involving easily damaged materials such as yarn, take a look at the system used by American Thread Co. at its Tallapoosa and Dalton (Ga.) plants.

Both of these mills ship large quantities of thread yarn to the Sevier, N. C., plant for finishing, a distance of several hundred miles. Corrugated cardboard boxes cost $1.70 each, and the daily bill for boxes alone amounted to $150 to $200 for both plants.

The plants found that they could use Cargotainers (Pittsburgh Steel Products Co.) in place of the expensive cardboard boxes and cut container cost.

The Cargotainers, made of cold-rolled steel rods, have a rubberized canvas innerlining that protects the yarn from damage. When the yarn is unloaded at Sevier, the containers are trucked back to Georgia.



Fewer Broken Filaments in Braiding

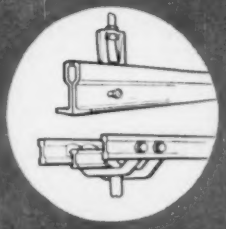
The spring tension on braider carriers causes most of the broken filaments in braiding.

But Industrial Elastic Corp., Pawtucket, R. I., has found a simple and inexpensive way of covering this spring. Result: Braid quality is improved by reducing filamentation.

The spring tension compresses only 20% or less but the braiding yarn is exposed to the full length of this spring. Industrial took an extruded nylon tubing, cut this tube to ¾ the length of the spring, and covered each spring with a nylon tube.

Now only the upper 25% of the carrier spring is exposed. And the braiding yarns very seldom have broken filament caused by catching on the carrier spring. This improvement along with other changes has reduced Industrial's seconds to less than 2%, management reports.

THE TRACK THAT NEVER WEARS OUT



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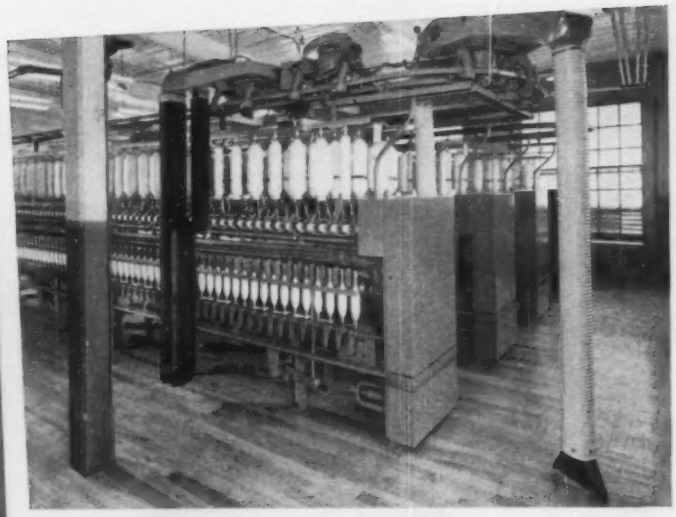
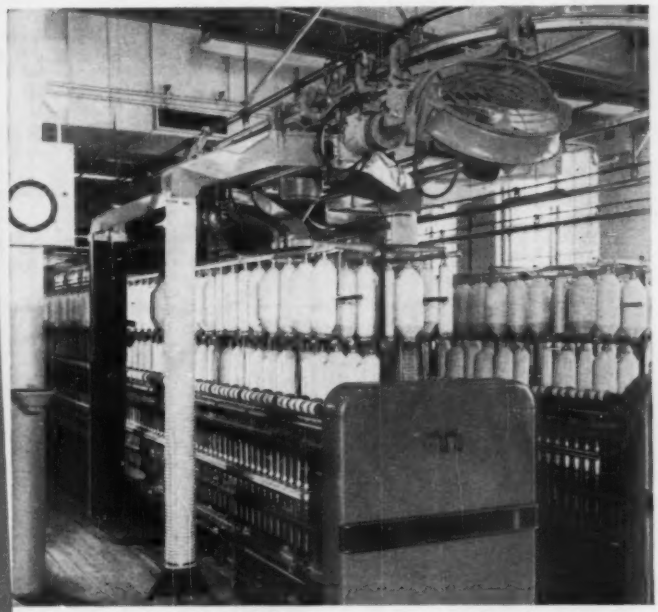


This creel mounted cleaner rides smoothly on Tri-Rail track and can never fall off. The three rails are rolled from high carbon steel.



This ceiling mounted cleaner rides on standard American Monorail track originally designed for handling 2-ton loads.

Save yourself track replacement with an American Monorail automatic cleaner installed on a track that's guaranteed for 20 years.

Rail furnished by American Monorail Company for use with automatic cleaning equipment is guaranteed against defects for twenty years, provided the cleaning equipment used in conjunction with the rail is of our manufacture. This guarantee is applicable to the rail only and not to rail accessories, such as support fittings, splices, electrification, switches, insulators, etc.

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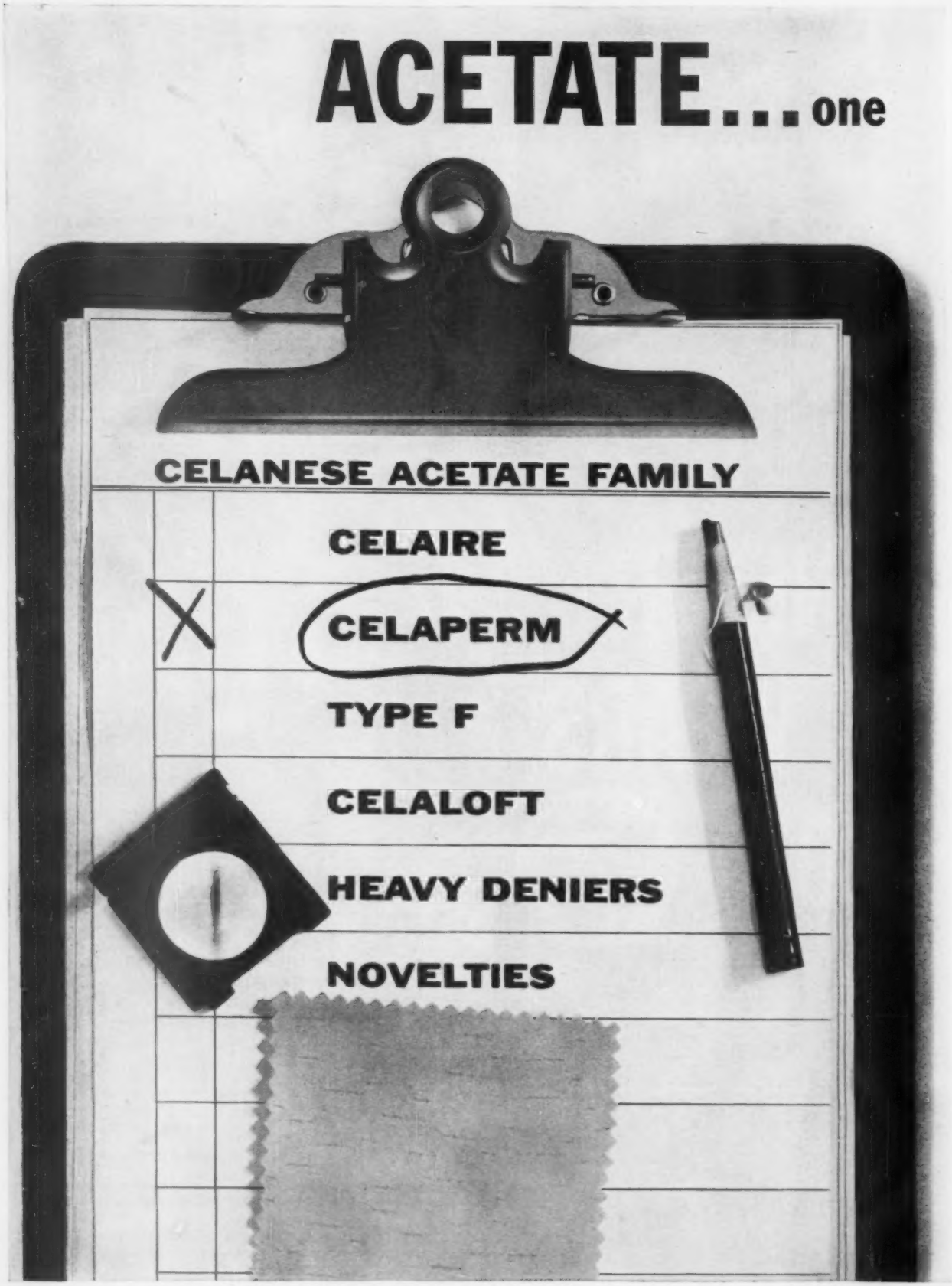
ACETATE... one
CELANESE ACETATE FAMILY
CELAIRE
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TYPE F
CELALOFT
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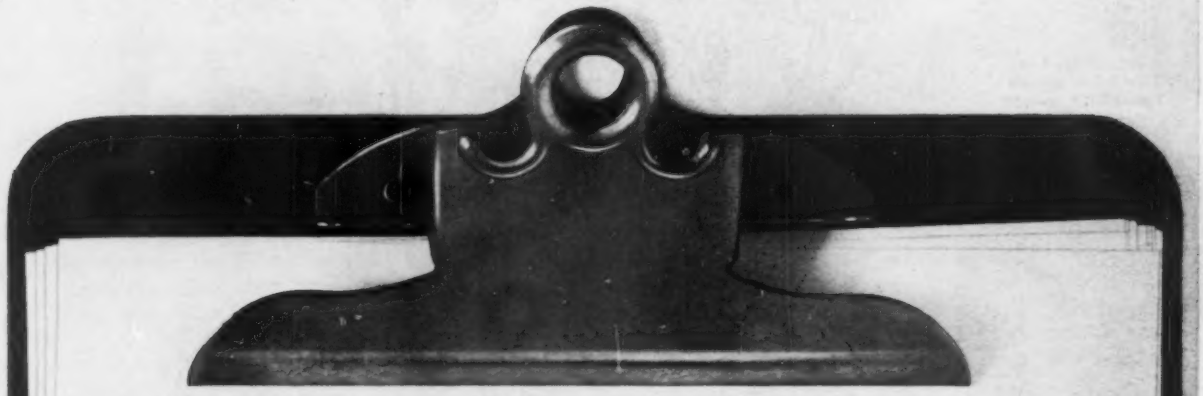
NOVELTIES

# of today's most versatile fibers



CELAPERM acetate with "sealed-in" color is another important member of the Celanese acetate family. This solution-dyed yarn with unsurpassed fade resistance serves a remarkable range of end uses. The filament yarn is available in a long line of wanted deniers and fashion colors for curtain, drapery and upholstery fabrics. And for apparel in circular knits, tricots and wovens.

Bulked filament Celaperm adds a new lofted look to home furnishings and upholstery fabrics. In apparel constructions it provides a crisp, rich, worsted-like hand.

Celaperm has a great potential for new constructions and Celanese is always ready to work with you on them. Celanese Fibers Company, Box 1414, Charlotte 1, N. C.

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Petticoats: Saramae
Tricot Fabric: Bangor
Yarn: ENKA nylon, for lovelier lingerie

Hose: Esquire Socks®
Yarn: ENKA nylon, for a smarter look, softer touch

Why so many good things begin with

ENKA NYLON Yarns

THE ANSWER is obvious—ENKA nylon is *made* to be versatile! How? First, Enka nylon has *greater absorbency*, makes nylon fashions comfortable to wear through sun-drenched summers, steam-heated winters.

Next, this amazing absorbency bequeaths our yarn a superior *affinity to dyes*. You'll find it responds beautifully to colors, keeps them sparkling and new through countless washings. White? Enka Blanc de Blancs™ nylon, created especially for the foundation market, has made possible the whitest of white nylon girdles with this dazzling counter appeal.

Best of all, Enka nylon has *natural resilience*, makes it easy to knit and texturize or weave into a bevy of handsome fabrics. Enka nylon has wonderful shape-retaining qualities, too, so fashions created with it always fit smoothly, never sag.

These are just a few of the reasons why so many good things begin with Enka nylon yarns. If you haven't tried versatile Enka nylon yet—get on the bandwagon and try it NOW! Call Enka Merchandising in New York, 350 Fifth Avenue, PE 6-2300 or the District Sales Office nearest you.

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What's New This Month in . . .

Fibers, Yarns, and Fabrics

By CAROL WILHELM, Copy Editor, TEXTILE WORLD

Target: Consumer

Pacific Mills Worsted Co. will aim an extensive slacks advertising and merchandising promotion directly at the consumer this spring.

According to George Staff, president, more than 65% of the company's advertising budget has been allocated toward this campaign.

Where will the money go? In what medium? In double-spread, full-page, color ads in the April and May issues of consumer magazines.

The slogan will be: "Be Specific . . . . Demand Pacific."

And It's Dacron

Quaker Lace Co. has something new in tablecloths—100% Dacron lace. It washes easily, drips dry, holds shape without stretching.

Called Kent, the tablecloth is available in natural and polar white. It comes in several sizes. The 70x90 size retails at $15.

For the Decorator

Herman Miller, Inc., is introducing a new collection of upholstery fabrics. Alexander Girard designed the collection.

The collection features sixteen basic designs in a variety of colors. All the fabrics are treated with Scotchgard stain repeller.

Here are some highlights of the collection:

Giant Stripes: a 46-54 cotton-worsted fabric available in 12 colors. It features broad stripes.

Jacob's Coat: a 46-54 cotton-worsted fabric with narrow vertical stripe. It is available in six color combinations.

Trispot Upholstery: a fabric containing 48% cotton, 39% rayon, and 13% mohair. It is available in 48-in. widths and in six colors.

Wooldot: a 54-in.-wide fabric of 64% wool, 11% nylon, and 25% cotton—and it's woven in Holland.

All fabrics are treated to meet the quality-control standards of Herman Miller, Inc., and Minnesota Mining & Mfg. Co.

Now It's in Color

Wamsutta Mills is now offering its Danube design in coordinated colors in sheets, cases, towels, and blankets. The design, one of the Vienna Revival Collection, was introduced last March in white-on-white. It features a Schiffli-embroidered bud design that was inspired by the intricate embroideries of the 1870's.

Now the company has extended the line to a selected color group that can be mix-matched with solid colors, or with white to form a variety of color combinations.

Carpets: 1961

James Lees & Sons Co. will give its carpets for 1961 the hand-loomed look.

Multicolor effects provide versatility for existing color schemes. Two, three, and sometimes five shades are combined in one carpet. The result: an iridescent effect where colors are similar, or a subtle-pattern definition where the colors are contrasting.

Here are some featured patterns for the coming season:

Happy Day is a ripple-textured, looped carpet in continuous-filament nylon. The carpet is offered in five two-color combinations. It retails at $11 a square yard.

Mountain Magic is an all-wool, random-looped carpet available in eight colors. Each color combines five shades. The carpet retails at $11 a square yard.

Prairie Ripple is a curl-loop textured, all-wool carpet. It is offered in 14 high-fashion colors and retails at $16 a square yard.

Whispering Winds, another all-wool, is a deep-pile, random-carved plush. Offered in 15 colors, it retails at about $30 a square yard.

Bravo, priced at $7 a square yard, is a random-loop tufted carpet in wool, comes in 10 colors.

Country Cottage is a homespun wavy-loop texture in 10 colors. It is all-wool and retails at $9 a square yard.

Orlon Clan Grows

Du Pont announced last month the development of three new types of Orlon fibers and an improved high-shrinkage Orlon staple.

One of the new types is a bicomponent Orlon Sayelle called Orlon Sayelle Type 24. Slated end uses: fine-gage, full-fashioned sweaters and flat-knit garments. The dyeing characteristics are similar to those of Orlon Sayelle Type 21. Its general processing will be limited to the worsted system as in the processing of Type 21.

Type 24 is now available in 3-den. cut staple and is priced at $1.45 a pound. Du Pont said that it will go into production of 6-den. staple and tow in the near future.

Another new type, Orlon Type 28, offers great stiffness, low crimp, high luster, and durable slickness. A weaver using a blended yarn of this type of Orlon and Orlon Sayelle can achieve an acrylic fabric that resembles a fabric of coarse-denier natural fibers. Orlon Type 28 is available in 8.5 denier, in cut length of 4½ inches, and in a bright luster.

The dyeing characteristics of Orlon Type 28 are similar to those of Orlon Type 42. It is expected that all dyeing of this new-type Orlon will be carried out in 75-25—or similar blends—of Orlon Sayelle and Orlon Type 28. In the processing, blending of Type 28 with Orlon Sayelle should be made prior to carding.

The third new type of Orlon: Type 44 acid-dyeable tow. Du Pont has

designed this new-type Orlon as a complement for Orlon Type 42. It offers improved economical styling through cross dyeing in either skein form or in piece goods. A manufacturer can now obtain a heather in 100% Orlon with yarn or piece dyeing, rather than through the previous necessary fiber dyeing. He can now get stripes and patterns with piece dyeing. Three-color effects in yarn and piece dyes can be achieved when color-sealed black Orlon is used in combination with Types 42 and 44.

This new type of Orlon tow is available in 6 denier and in a semidull luster. Total tow denier is 470,000. It can be processed on the Turbo Stapler with conditions normally used for Orlon Type 42 and will produce yarn shrinkages in the range of 30 to 35%.

Orlon Type 44 can be dyed—with selected acid dyestuffs—in a complete range of shades (including bright colors) with good wash and lightfastness.

Du Pont has also developed a new, improved high-shrinkage Orlon staple. Yarns produced from this staple will contain about 4% additional yarn shrinkage as compared to yarns made from the former high-shrinkage staple.

This staple in Type 42 Orlon is available in semidull and color-sealed black lusters and in 2, 3, 4.5, 6, and 10 deniers. Staple lengths range from 1¼ to 4½.

Tests indicate that this staple processes the same way as other Type 42 staple products.

Got Stretch

Medical Fabrics Co., Inc., is field-testing its two newly developed elastic cloths in the medical field.

1. Medron. An all-cotton cloth (warp stretch) bonded with a polyurethane foam. Withstands commercial launderings as well as steam sterilization. The company is field-testing it for use as compression bandages and dressings. Successful trials have been made in the thoroughbred racing field, where it is used as protective running bandage.

2. A two-way stretch cloth laminated with polyurethane.

Helps Homemaker

Now manufacturers of textile products can offer consumers a new feature—printed product-care directions that last the life of the product.

This feature was presented by the National Retail Merchants Association (NRMA) to 21 leading textile-manufacturing executives. NRMA feels that adoption of this feature would reduce consumer complaints from faulty washing, ironing, and cleaning procedures.

The NRMA Sure Care Symbols—the name designated for the printed instructions—can be applied to the hanger of a garment or attached to any part of any textile product.

Traces of the Past

Lozano-Fisher Studios, Inc., custom handweavers, introduced its new Stained Glass Collection of handloomed fabrics last month. The collection is a high-styled, romantically designed group of handloomed blinds inspired in color and feeling by the stained-glass windows of medieval churches, Tiffany glass, and leaded glass—all influences of our historical yesterdays.

The *Stained Glass* weave is a rich composition of royal purples, garnets, and ice blues used in the window of the Cathedral at Avignon. The studio has used wool, cotton, and man-made-fiber yarns. The colors appear to change and deepen from hour to hour, influenced by the natural light.

Leaded Glass blinds are in beige, white, and gold wool within large squares and oblongs of black wool reminiscent of Gothic.

Tiffany Glass is a monochromatic study in topaz and Chartres gold. Bold elliptical shapes are defined in heavy black wool.

The studio also showed other new weaves for window treatments. The *Mikado Collection* features the Oriental theme on handwoven plastics. The Dutch East Indies influenced another collection. Aluminum thread, vinyl-covered fiber glass, and lacquered thin wooden sticks form the warp and filling of this fabric.

The *Vertical Blind Group* features woven strips from 3 to 7 inches wide. The strips traverse on vertical blind hardware. One model from this group shows 4½-in.-wide bands of unwoven yarns in bright Mediterranean colors.

Now Crimped

Courtaulds (Alabama), Inc., is selling a new permanently crimped cross-linked rayon called Corval II. This fiber replaces Corval, the uncrimped cross-linked rayon that was introduced by the company in 1958. Slated end uses: in blends and combinations for men's and women's wear and domestics.

The company is marketing the new fiber in deniers from 1½ through 15 in all normal lengths of semidull luster. The product sells at 37¢ a pound.

The fiber has good bulk and cover. It may be processed on all spinning systems and dyed with all classes of cellulosic dyes.

Jacquards in '61

Collins & Aikman has announced that 70% of its auto seat-cover line for 1961 will be in jacquard designs—similar to the original bodycloth. And one-third of its line will be in nylon.

What prompted this decision? Detroit styling has leaned toward the jacquard design in recent years. Jacquard designs have an expensive connotation. And they offer greater versatility of design.

Further upgrading its seat-cover line, the company has finished its nylon and rayon fabrics with a stain-repellent, moisture-repellent finish called Spotshed.

New Ceramic Fiber

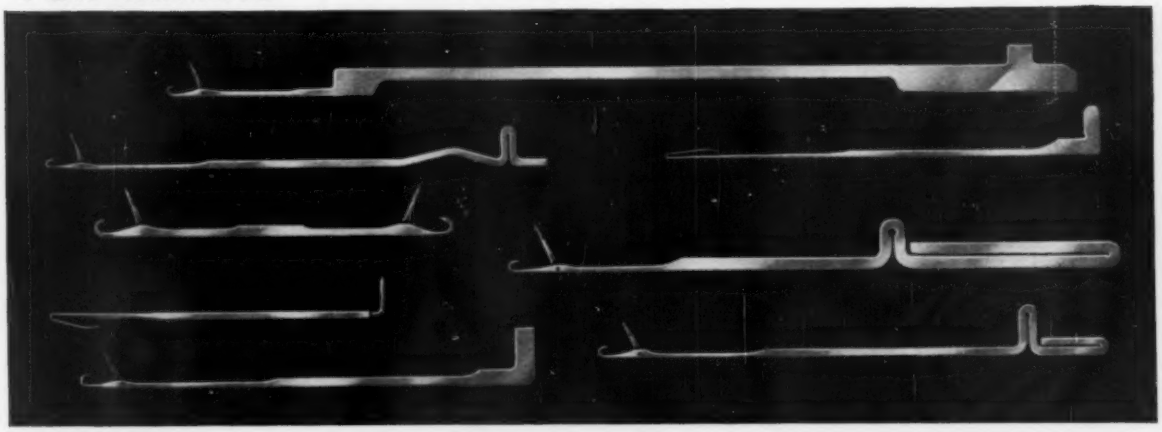
Carborundum Co.'s Refractories Div. is now offering to industry its ceramic fiber, Fiberfrax.

The fiber withstands continuous operating temperatures up to 2,300 F., can be used in wovens and nonwovens, and has good drape.

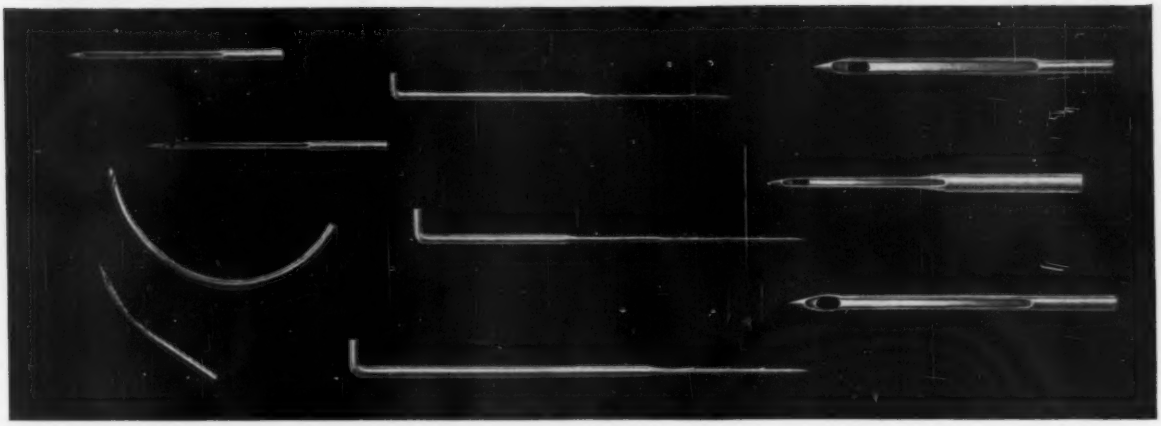
KEEP IN MIND . . .

when you use Torrington machine needles you use the finest available—and have the benefit of the advice and counsel of Torrington experts, who are skilled in solving your needle problems.

FOR KNITTING



FOR SEWING FOR FELTING FOR TUFTING



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TORRINGTON MEETS EVERY NEEDLE NEED: SEWING · KNITTING · TUFTING · FELTING

Cleanest,
most efficient drafting unit
ever developed...

New Model
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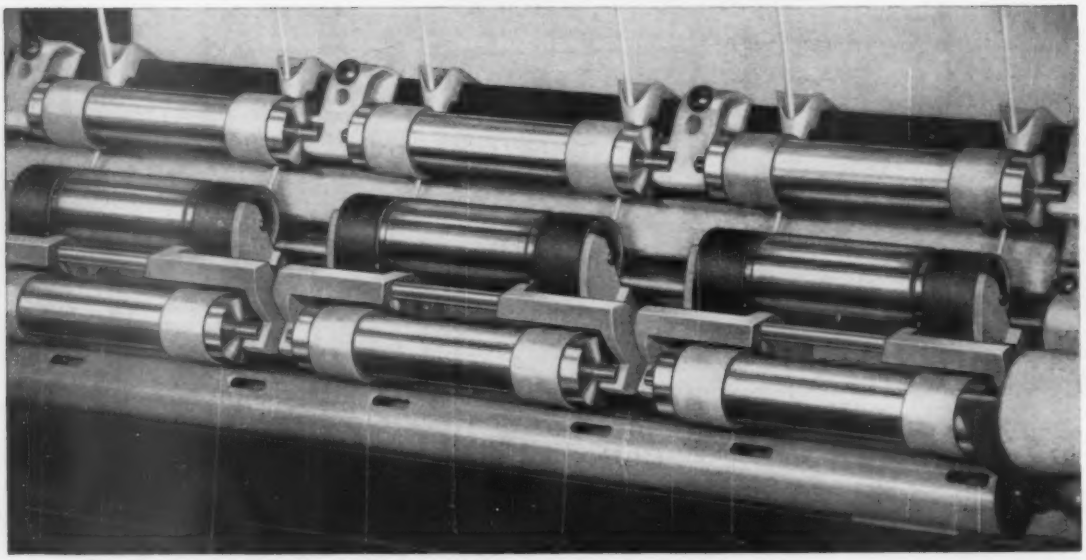

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**Requires no lubrication in drafting zone —
Eliminates all conventional weighting equipment.**

Uses forces of magnetic attraction to produce required roll pressures — completely eliminates anti-friction top and bottom rolls, saddles, stirrups, levers, hooks, springs and weights. New, unique top front roll support allows quick "end around" piecing up. Due to few component parts, maintenance costs are reduced to an absolute minimum. Mills report that MAGNEDRAFT spins stronger, more even yarn with a substantial reduction in drafting gear wear.

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TEXTILE WORLD . . . Equipment and Supply News

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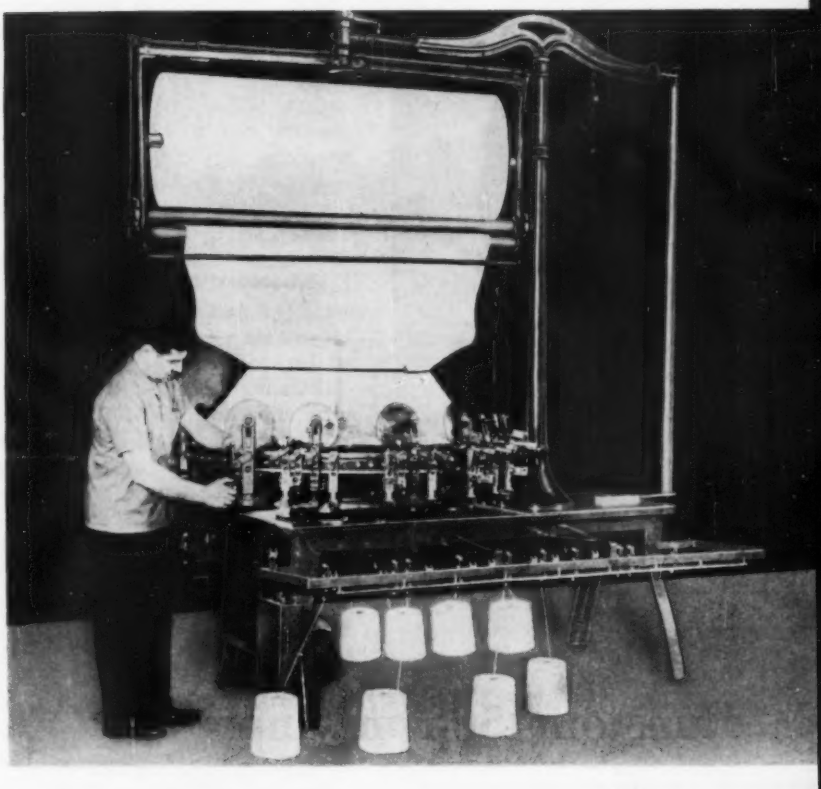
Now—Knitted Carpet Scrim

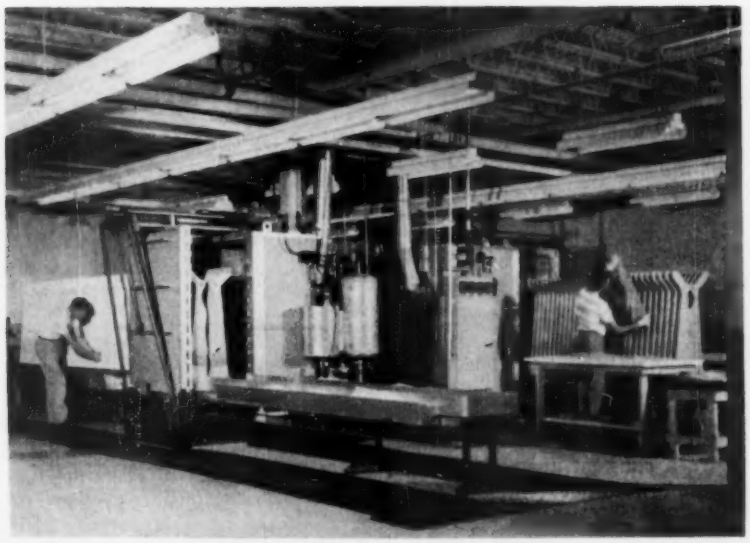


A circular-knitting machine, designed by Tompkins Brothers Co., makes a stable, nonstretch, paper carpet scrim.

This unit—with a 54-in.-dia. cylinder—produces a 12-ft.-wide fabric. A 70-in. machine makes the 15-ft. material. Knitted fabrics move upward without twist or fabric distortion and wind on a large take-up roll. This take-up roll is easy to reach and to doff.

The knitting machine, which is a spring-needle type, ties the loop to the outside mesh of the basic fabric, similar to heavy fabric knitting. The result is a very stable material. Standard Tompkins parts can be used on this new machine. And it is a multifeed machine that has two separate stop motions built in on each yarn feed for improved quality. (Circle E-1 on Reader-Service Card)

Dyeing 5-Dozen Stockings in 7 Minutes



The dyeing and finishing cycle has been reduced to seven minutes on the Turbo Machine Co.'s dye boarder, increasing efficiency by 15 to 20%. Now two operators produce 160- to 170-dozen pairs of hosiery in eight hours.

The dye boards use 120 hosiery forms and each operator strips and dresses 30 forms each while the other 60 forms are in the process cabinet. After pre-steaming, the dye solution is pressure-sprayed onto the hosiery. Once the dyeing time and temperature are established, shades can be matched from lot to lot. Detergent, resin finish, or lubricant can be added to the concentrate. (Circle E-2 on Reader-Service Card)

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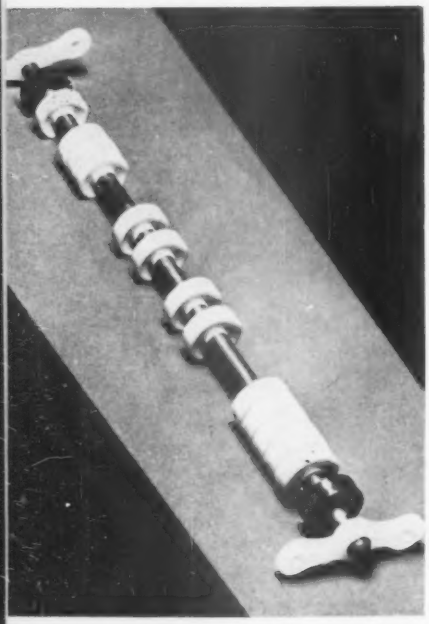
Colored Nylon Pattern Chains



Nylon pattern-chain parts for gem heads now come in any color. By using colored risers as reference points, weave repeats are easily located and downtime for error locations or corrections is reduced—thus increasing efficiency. These nylon risers, sinkers, and links (sold by Lignostone Import Co.) are 66% lighter in weight than the steel parts they replace. This weight reduction decreases power consumption and makes handling of the weave chains easier.

Because the nylon doesn't need lubrication there is less mess and no chance for oil stains from the chain. These nylon units also run quieter (because there is no metal-to-metal contact) and are dimensionally stable, which reduces chain jamming. They wear longer than steel parts. (Circle E-3 on Reader-Service Card)

Runs on 450-rpm. Input

Designed for textile processing, the Contorq variable-speed drive runs on 450-rpm. input.

Developed and sold by Fairbairn, Lawson, Combe & Barbour Ltd., this drive converts the 450-rpm. input to a variable-speed range of 0 to 50 rpm. and maintains a constant torque. Speed changes are made by turning a graduated dial.

The output shaft takes a number of different auxiliary equipment such as worm gears, wheel gears, bevel drives (for changes of direction) or a differential drive. This differential drive allows the selection of output speeds in any 100 rpm. range (0 to 100 rpm., 200 to 300 rpm., 900 to 1,000 rpm., etc.). Also any auxiliary motor can be flanged to the input shaft. The unit operates on cams that are designed to give a constant angular velocity with uniform torque. (Circle E-4 on Reader-Service Card)

E-5—Weaving-test instrument gives an accurate measurement of the cloth fell right on the loom. The unit uses an optical system that throws an enlarged image of the cloth fell onto a screen. With this instrument these three important weaving problems can be solved: (1) the effect of cloth fell in maintaining even pick-spacing on open fabrics; (2) the inertia of the cloth fell on heavy fabrics; and (3) the effect of cloth fell when the picks per inch remain the same but the yarn size is changed. This instrument also checks many other weaving factors such as warp and filling tension, size, lubricant, weave, and yarn number. Newmark Distributors Ltd.

Nylon Cradle for Spinning Rolls

A molded nylon cradle, called Ny-Pre-Lon, has been developed by Progressive Engineering, Inc. The unit supports the middle top roll and the aprons (between the middle, top and bottom rolls) on spinning and roving frames. The unit needs no lubrication and will not cause wear on the rolls. This means that its positon never changes because of wear.

The cradle has a snap-lock action onto the bottom roll because the lower portion of the cradle is designed as a 180-degree arc. Also, the gap between the aprons can be varied by using different size U-shape clips. (Circle E-6 on Reader-Service Card)

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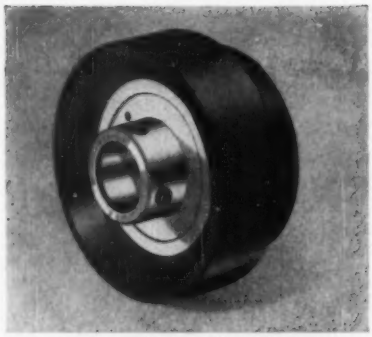

Idler shell on driving roll which contacts the small end of cone on the Model 102. If this shell sticks on the bearing, it will cause hard nosed cones and burned yarns. Therefore, it requires the best in materials and workmanship.

Close delivery thread guide and dog for Foster Model 102. These parts are made from steel forgings which require very accurate and expensive dies. The finish on these parts also plays an important part in their performance.

Profilometer (which measures irregularities in millionths of an inch) used by Foster to test the inside surface of a tube which is part of the Model 102 for processing Textralized* yarn (*trademark of Joseph Bancroft & Sons).

Micro-Projector, an optical testing instrument used by Foster to magnify the silhouette of an object 62½ times and thereby reveal imperfections invisible to the naked eye.

How to Get
FULL VALUE
From Your
FOSTER WINDING EQUIPMENT

We don't have to tell you that in order to get full value from your Foster winding equipment, it must be properly maintained and repaired. The question is, how can you be assured of proper maintenance and repairing?

As to repairs, the first step is to use genuine Foster Repair Parts. Many Foster parts are made of special materials and have special finishes which cannot be duplicated with cheap substitutes. Furthermore, many Foster Parts are scientifically tested, before assembly, with high-priced testing equipment, which is not available in the ordinary machine shop. The illustrations herewith give a few examples of what we refer to.

Second, use *Preventive Maintenance*. By so doing you gain in 5 ways: — 1. Increased winding efficiency. 2. Less wear on and longer life of parts. 3. Better winding. 4. Improved customer relations (if you're a sales yarn mill). 5. Reduction in costly breakdowns. Without preventive maintenance, the same 5 gains turn into losses.

The best way to utilize preventive maintenance is to have a Foster Service Man make periodic inspections of all your Foster Winding Equipment, in conjunction with your Maintenance Supervisor. This Foster Service Man will give you a written report on the condition of your Foster equipment, will suggest improvements in maintenance practice, if necessary, and will recommend replacement of parts when advisable. There is no charge for this service *if* our representative is permitted to fit his visit to your mill into his planned call schedule.

If you would like to know more about getting full value from your Foster Winding Equipment, write for our three booklets: — "Preventive Maintenance", "Why Genuine Foster Parts" and "Emergencies are Costly". No obligations.

A Member of
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A Yarn Winder for Every Purpose

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Equipment and Supply News

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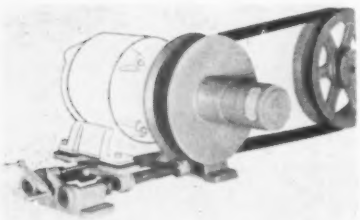
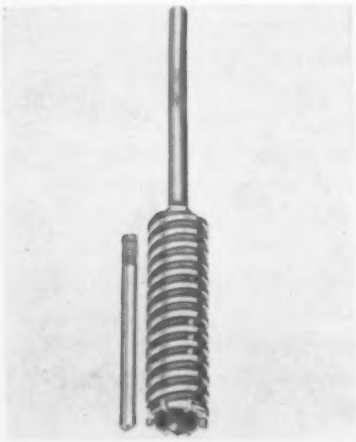


E-7—Variable-speed drive has a 3 to 1 speed-change ratio. It's rated for 25 hp. at 1750 rpm. The drive, Roto Cone No. 1325, is used with an adjustable motor base and a V-belt companion sheave. The unit is available for motors from ½ to 25 hp. Gerbing Mfg. Co.



E-8—Masonry drill works on all kinds of concrete, brick, or stone. It has a specially designed starter point that locates the hole center and holds it until the cutting teeth engage. Twelve sizes are available ranging from ⅞ to 2½ inches. Holub Industries, Inc.

E-9—Carriage bolts, made from high-carbon steel, have a tensile strength of over 130,000 psi. Bolts take high-stress conditions without stretching or shearing. They are also specially treated for rust and corrosion resistance. Premier Industrial Corp.

E-10—Tray de-aerators protect against corrosion of boiler tubes, feed-water lines, and condensate-return lines. When integrated into the boiler-feed system it reduces fuel costs because the unit recovers heat from the exhaust steam. All water-contacting tray and tray chest internals are made of stainless steel and are designed to prevent aerated water from touching the outer shell. Permutit.

E-11—Storage water heaters, called NiaWel, come in 55 different sizes of vertical or horizontal type with a choice of 144 different heating elements. The heating element is a U-tube and is removable. Standard welded-steel tanks can be lined with phenolic, porcelain, cement, or hot-dip galvanizing for corrosion resistance. Special tanks are available in copper-silicon, Monel, Inconel, aluminum, nickel-clad, or stainless-clad steel. Also tanks can be supplied with various linings such as phenolic, porcelain, or hot dip galvanizing. Niagara Weldments, Inc.

E-12—Gravity-feed water filter operates fully automatically without the use of any outside source of power. The filter bed is backwashed by a siphon that operates on a loss-of-head principle. The unit consists of a vertical cylindrical steel tank that is divided into three horizontal sections—backwash, filter bed, and collection chamber. The filter bed is fine-filter sand. Permutit Co.

E-13—Small filter chamber works on corrosive chemicals. The unit is 5 inches high by 2 inches in diameter and weighs 8 ounces. Filtering capacity is 5 to 7.5 gph. using cotton, Dynel, porous stone, or carbon filter tubes. Micron removal ranges from 150 down to 1 micron. The threaded center rod is Type 316 stainless steel and the outlet ports take ⅜-in. ID tubing. Air can be bled out through a vent in the top during filtration and the unit can be drained to the last drop before disassembly for cleaning. Sethco Mfg. Corp.

E-14—Stopcock lock has a positive locking action without using springs or clamps. Made of chemically inert Teflon and Marlex 50, this lock fits all standard glass stopcocks. It's available in five sizes to fit standard taper glass stopcocks. Fischer & Porter Co.

Turn to page 118

NEW RESEARCH FACILITIES...

to better serve the textile industry!

On Friday, November 11, 1960, Sonoco dedicated its new Research Laboratories Building which provides the industry with the *largest, most complete* laboratory in the field of paper textile carriers.

The building was dedicated in memory of Dr. J. E. Mills, Sonoco's first Chief Chemist and Research Director. It is a fitting tribute to a man who pioneered research in special lacquers, resins, coatings, adhesives and specialty papers for textile cones and tubes.

With new and enlarged experimental and research facilities, Sonoco's "problem-solvers" are in the best position ever to render technical service on customer problems, an added benefit when you buy from Sonoco.

This laboratory expansion typifies the leadership maintained by Sonoco for over 60 years. Continuous research and product development plus integrated manufacturing plants assure Sonoco customers of products which are "standard of the world"—*you can continue to depend on Sonoco.*

SONOCO

Products for Textiles

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PAPER PRODUCTS

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NEW D & F Model "H" (Lower and Narrower) SPINNING FRAME

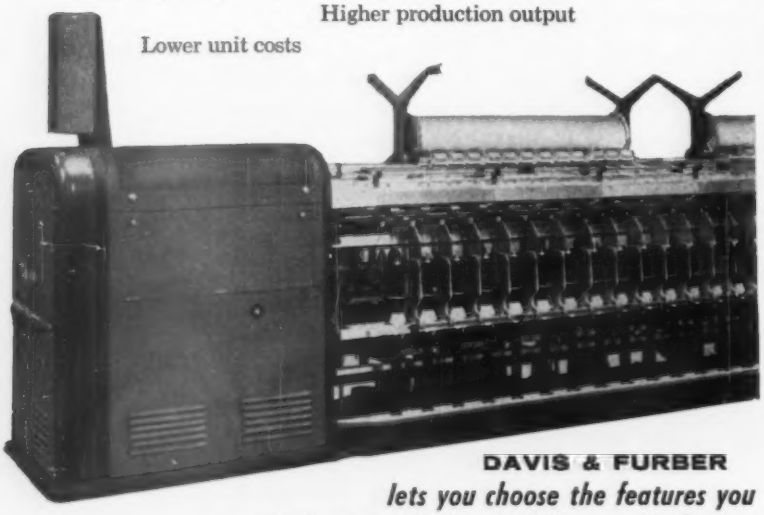
. . . lets you choose your own frame specifications for:

Controlled, improved spinning

Better yarn quality

Higher production output

Lower unit costs



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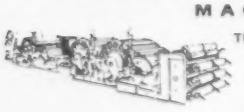
lets you choose the features you need. There are 51 in all. 30 are entirely new.

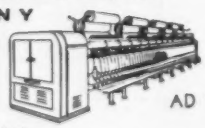
- ☐ Increased package size
- ☐ Reduced floor space (15% approx.)
- ☐ Variable speed drive
- ☐ Automatic needle injection-type spinning rings
- ☐ Ballooning rings
- ☐ Ring size up to 6"
- ☐ Gauge size up to 7½"

Check the items of interest. Tear out advertisement and mail to us at once. Call us, or simply get in touch with your own Davis & Furber man. Send for new Model H Spinning Frame folder. Find out what "COORDINATED PRODUCTION" can mean to you.

DAVIS & FURBER
MACHINE COMPANY



TEXTILE MACHINERY DESIGNERS AND MANUFACTURERS
North Andover, Mass.
Charlotte, North Carolina



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MACHINERY MODERNIZATION • ACCESSORIES, SUPPLIES, CARD & NAPPER CLOTHING, GARNET WIRE, TAPES & APRONS
SPARE PARTS • TECHNICAL SERVICE & CONSULTATION

Equipment & Supply News

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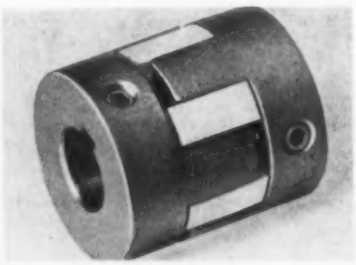
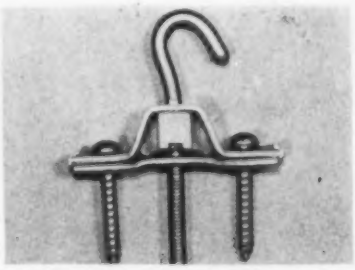


E-15—Flexible couplings, of stainless steel and Teflon, work on pumps handling corrosive liquids. The Teflon spider needs no lubrication and acts as an insulator for stray current. The unit is available in bore sizes from $\frac{5}{16}$ to ¾ inch. Eco Engineering Co.

E-16—Plastic material repairs all types of equipment such as castings, pumps, machinery, and valves. The kit consists of two three-oz. tubes of material, which are mixed on the job. This mixture contains 80% aluminum and 20% epoxy resin, and won't shrink when it dries. Of particular interest is its good adhesion properties for steel, iron, aluminum, bronze, and glass. Devcon Corp.



E-17—Harness-frame hook, designed to prevent stripping out of the frame, uses shorter connectors. It has a spring clip attachment that keeps a constant eye rigidity. Adaptable to wood or aluminum frames, the hook has a 1¼-in. tolerance adjustment. Louis P. Batson Co.

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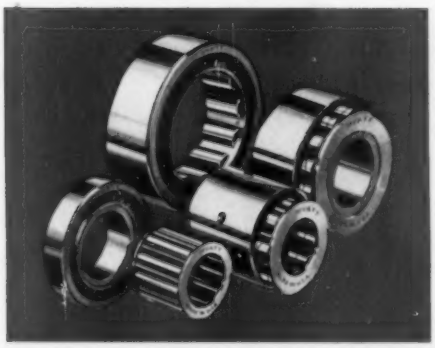
In America's Finest Textile Mills . . .

HYATTS ROLL CLEAN, FREE AND TRUE !

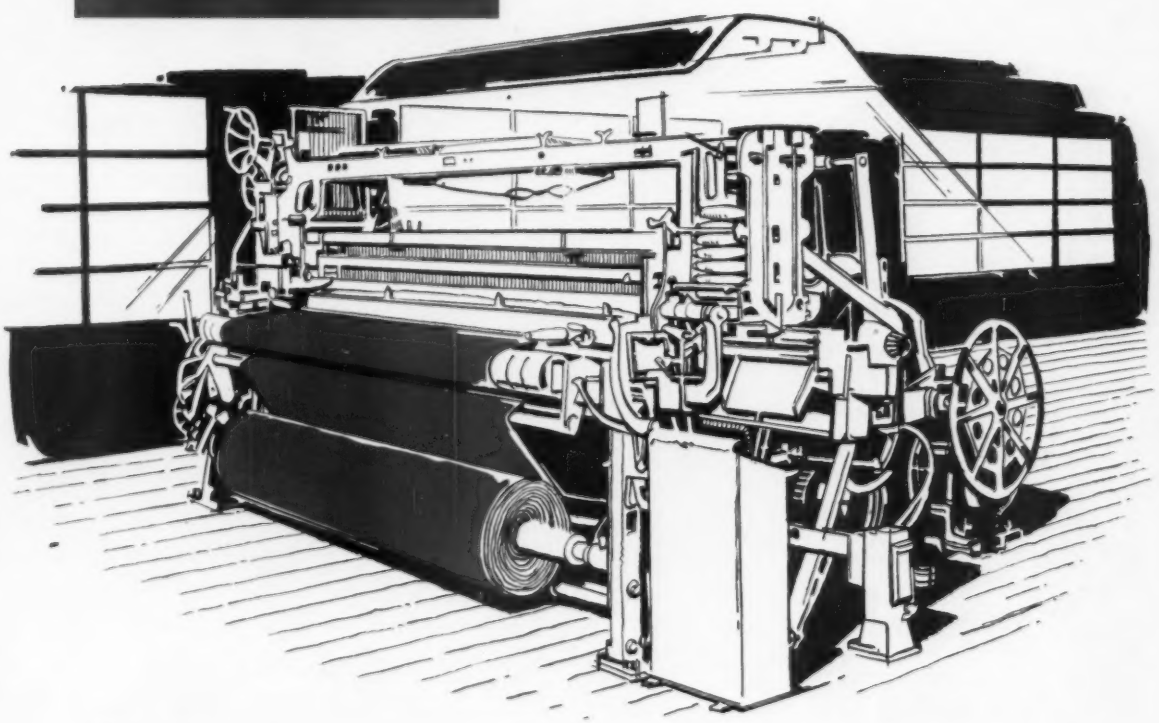


The critical "X" factor today in producing better textiles at lower cost is machinery that runs *clean*, *free* and *true*—from carding to finishing. The profitable solution hinges on Hyatt Hy-Roll Bearings. Hyatts reduce costly seconds by eliminating oil spatter completely. With Hyatts, you can eliminate the binding and excessive play, so troublesome with old-fashioned plain bearings. And Hy-Rolls save you up to 40% on power—up to 90% on lubrication. What's more, Hyatt Hy-Rolls require practically no maintenance.

Remember this when you modernize or replace textile machinery: It will pay you to standardize on HYATT Roller Bearings.

STANDARDIZE ON HYATTS FOR:

Cards • Drawing and Roving Frames • Spinning Frames
Looms • Dry Cans • Tenter Frames • Shears • Washers
Fulling Mills • Textile Machinery Motors



THE RECOGNIZED LEADER IN CYLINDRICAL BEARINGS

HYATT HY-ROLL BEARINGS FOR THE TEXTILE INDUSTRY

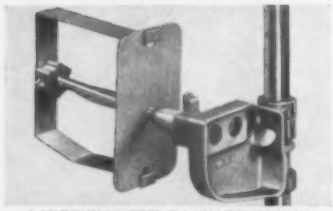
GM GENERAL MOTORS

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

HERE'S HOW TO HANDLE ANY PACKAGE WITH McBRIDE VERSATILE PACKAGE HOLDERS

McBride Bowed Spring Spindle with cone and large package holders can accommodate every type of package used on Over End Take-Off today. Adapters feature the quick change design for instant placement or removal, to **cut down changeover time loss.**

UNIVERSAL CONE HOLDER



LARGE DIAMETER PACKAGE HOLDER

MERCURY SWITCH STOP MOTION

Let McBride study your creel requirements. You will be pleased with the improved efficiency, ease of operation, and rugged design of McBride creels. Creels for warping, weaving, winding, twisting, tufting, and knitting. Special laboratory warping units designed to suit your requirements.

Complete engineering service is part of every McBride installation

McBRIDE COTTMAN AVE. & WISSINOMING ST. PHILADELPHIA 35, PENNSYLVANIA

In Canada: Hugh Williams & Co., 27 Wellington St., E. Toronto 1, Ontario

Equipment & Supply News

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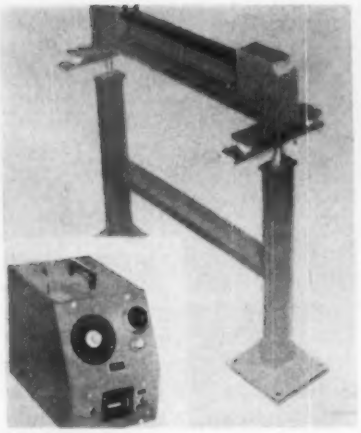
E-18—Sealer for heavy-duty strapping assures a properly sealed joint. Two units are available: Model B-1435 for 1¼-in. strapping and Model UB-250 for 2-in. strapping. The improved crimping makes a stronger, safer joint. Signode Steel Strapping Co.

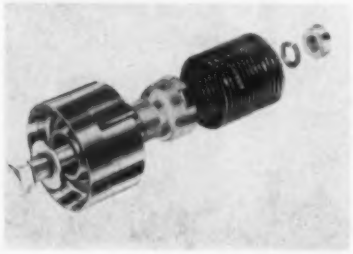
E-19—Table size scale, Model 1070, provides instant reading with no movement of the indicating element. The unit has a tare knob that permits presetting weight adjustment for scoops or boxes. The scales measure 15¼x20½x23½ inches. Toledo Scale Corp.

E-20—Electric hand drill, ⅜ inch, uses a new motor with 23% more horsepower than the previous model. High stall torque makes the drill suitable for use on stainless steel. The unit runs at 850 rpm. free speed and weighs 4¾ pounds. Thor Power Tool Co.

For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.



E-21—Warp-yarn inspector eliminates quality-control problems during warping. This instrument works with the Fabrionics Warp Yarn Monitor, a photo-electric yarn-fault detector. The inspector counts linear defects and end breaks, then stops the warper for their removal. With this system the Warp Yarn Monitor runs without a light cover. This makes the yarn more accessible. Fabrionics Corp.



E-22—Heel spring shell comes in all-nylon construction. Spring life is increased because there is no metal-to-metal contact and no lubrication is needed. The concave outer surface prevents the heel strap from slipping off. The shell works on all Draper and Crompton & Knowles "C" and "S" looms that are equipped with parallels taking ⅜-in.-dia., heel-spring shell bolts. H. F. Livermore Corp.

Turn the page

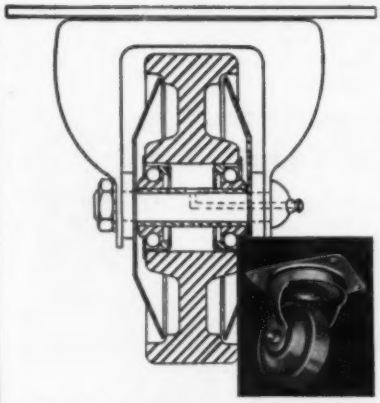
ACHIEVED!

Textile Casters That Won't Bind!

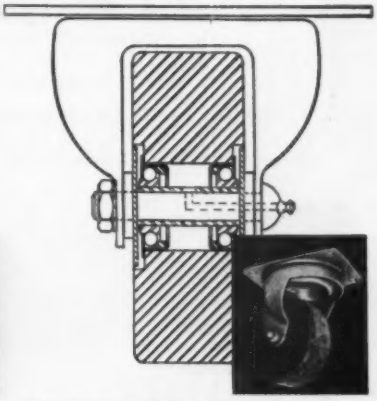
FAIRBANKS TEXTILE CASTERS

Never Before Such Sure-Fire Protection Against Threads And Lint!

Available In 2 Wheel Types:

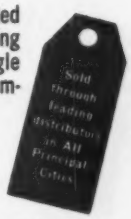


Precision cast, ballbearing semi-steel wheel—perfect concentricity; smooth, thick tread and big tread edge radius — protects floors and rolls and swivels easier. Threadguard protects in two directions: vertically, by tight fit to concentric inner edge of wheel tread; horizontally, by tight fit to molded step on web of wheel. Spacer washer, between threadguard and caster leg, eliminates V trap—allows lint and thread to fall free or, if caught, cleaning out without removing wheel. Available in 4 and 5 inch sizes.



"LAMILON", All-Plastic, ballbearing wheel permits standardization on one wheel for any section of the plant. Protects wood and concrete floors, resists sticking of ring travelers and gives excellent service in bleacheries and dye houses. Tight flush-face threadguard has very close fit in machined recess in wheel. Flush-face design decreases chance of falling lint and thread catching in wheel. Spacer washer, between threadguard and caster leg, eliminates V trap—allows lint and thread to fall free or, if caught, cleaning out without removing wheel. Available in 4 and 5 sizes.

Fairbanks patented "LOCKWELD" Steel Swivel Casters have eliminated the king-pin — major cause of swivel caster failures — providing stronger, easier swiveling, longer lasting casters. Available in single ball race, regular duty, sizes 2 to 6 inch; double ball race, medium-heavy duty, sizes 3 to 8 inch, with matching rigid casters.



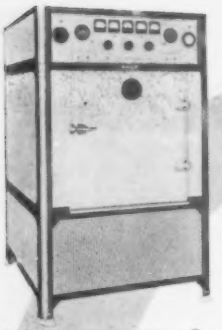
THE **Fairbanks** COMPANY

Executive Office: 393 Lafayette Street, New York 3, New York

Valves • Dart Unions • Casters • Trucks • Wheels

520 Atlantic Ave. Boston 10, Mass. | 2600 S. Throop St. Chicago 8, Ill. | 393 Lafayette St. New York 3, N. Y. | 15 Stanwix St. Pittsburgh 22, Pa. | 202 Division St. Rome, Ga.

Factories — Binghamton, N. Y. and Rome, Ga.



WEATHER-OMETER®
Reduces years of the deteriorating effects of outdoor exposure to sunlight, rain and thermal shock to a short laboratory test. Priced $2735.00 up.

FADE-OMETER®
Simulates exposure to Sunlight with controlled humidity in alternate cycles of light and dark, producing a quick accurate test of fading qualities. Price $1350.00 up.

LAUNDER-OMETER®
The standard test machine of the A.A.T.C.C. for determining the color fastness, shrinking, washing and dry cleaning qualities of textiles. Price $875.00.

Atlas-Ometers

Used all over the world for accelerated testing of textiles and dyestuffs, for colorfastness and wearing characteristics due to light, washing, weathering, abrasion, perspiration, etc. Required in many A.A.T.C.C. and A.S.T.M. test programs and Government specifications.

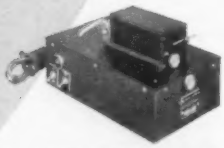
ATLAS ELECTRIC DEVICES CO.
4114 N. Ravenswood Ave.
Chicago 13, Illinois, U.S.A.

ACCELEROTOR®
Developed by the A.A.T.C.C. for evaluating wet and dry abrasion resistance of fabrics. Price $485.00.

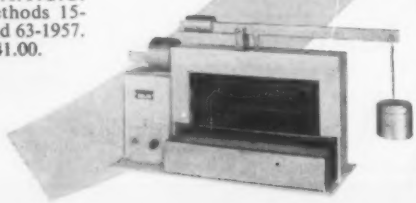
RANDOM TUMBLE PILLING TESTER
For the fast determining of the pilling and fuzzing characteristics of all types of fabrics. Price $485.00 to $890.00.

A.A.T.C.C. CROCKMETER
For determination of color fastness to crocking. $42.50 to $55.00.

PERSPIRATION TESTER
For testing color fastness to perspiration and water. A.A.T.C.C. test methods 15-1960 and 63-1957. Price $41.00.



SCORCH TESTER
Standard A.A.T.C.C. tester for damage caused by retained chlorine in fabrics. Price $230.00.



LABORATORY WRINGER and PADDER
For extracting controlled amounts of liquids to produce test specimens as required by many textile test programs. $255.00.

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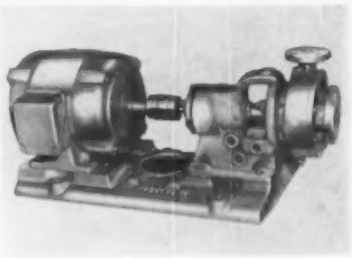

E-23—Centrifugal pump—Model 3199—for corrosive chemicals handles up to 115 gpm. at heads up to 150 feet. They are available in two sizes. Stuffing box has 5 rings of die formed packing and lantern-type, liquid-seal ring. Mechanical seals can be used without altering the stuffing box. Pumps come in bronze fitted, all iron, all bronze, type 316 stainless steel, or Gould-Alloy 20. Goulds Pumps, Inc.

E-24—Photoelectric control uses transistorized, printed circuit in a flashlight-type cylinder 7½ inches long by 1⅜ inches in diameter. Conduit hub is threaded for ½-in. pipe for mounting in any position. The unit operates on light impulses as short as 0.015 second at distances up to 20 feet. It has a single-pole, double-throw relay contact. Electronics Corporation of America.

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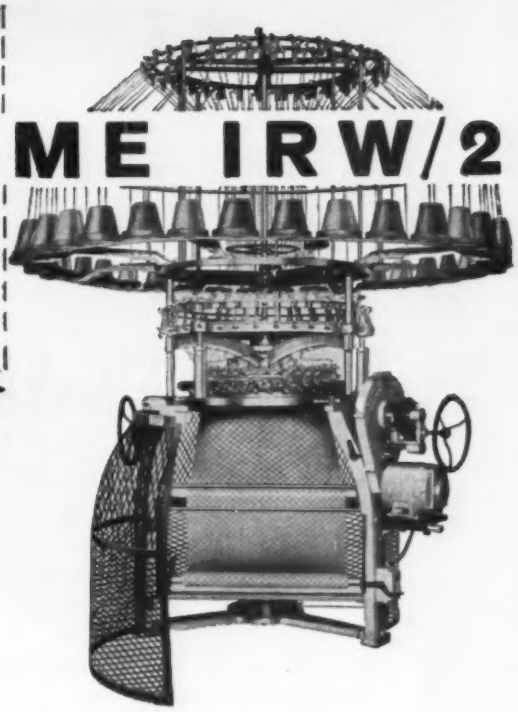
NEW SUPREME IRW/2



Puts You 50% AHEAD OF TODAY'S PATTERNED RIB INTERLOCK FIELD

- **36 feeds — 50% Greater Production Than Any Present Machine**
- **50% Greater Pattern Area Than Previously Possible**
- **Unsurpassed Versatility**

Supreme's model IRW/2 knits *up to 42 yards per hour* of patterned or plain rib and interlock yard goods for outerwear and bathing suits.

Its 36 feeds give the knitter a tremendous advantage over existing machines in output and pattern area. All feeds are equipped with extra large pattern wheels (up to 6" diameter wheels supplied as standard equipment with larger diameters available optionally). The IRW/2 is 30" in diameter and available in cuts up through 16 per inch.

DUAL RACEWAY GIVES VAST SCOPE OF PATTERNS & TEXTURES FOR OUTERWEAR

The dial has a dual raceway for rib or interlock production. The needles of either raceway may be set in knit to tuck or knit to welt positioning — providing a sweeping range of patterns and textured rib or interlock production.

Supreme's new feeding rollers for accurate and positive control of rubber yarns are available as optional equipment . . . providing an extra advantage for bathing suit fabric producers.

Has Supreme's Standard, Mill-Proven Features including revolving cylinder — stationary yarn stand — rugged, dogless construction, etc.

Write for free booklet on this important advance in the interlock field.

SUPREME
KNITTING MACHINE CO., INC.
94-02 104th STREET, OZONE PARK 16, N. Y.

Southern Representative and Showroom:
MONROE MACHINERY SALES CO.
P.O. Box 342, MacArthur Circle, Monroe, N. C.

SK-194

FOR TODAY'S NEW AGE OF COLOR BRILLIANCE...

SYNTHETIC YARNS

PACKAGE-DYED BY GLOBE . . .

Your creations can't help but be enhanced—both as to elegance and attractiveness, when they are decked in rich, long-lasting colors, imparted by Globe-dyed synthetic yarns.

Globe does package dyeing on tubes, skein and warp dyeing, warp bleaching and sizing.

Yarns processed include cotton, worsted, linen, blend and novelty yarns, and all synthetics including Arnel®, Creslan®, Orlon®, and Zefran®.

4500 Worth Street
Philadelphia 24, Pa.

Globe DYE WORKS CO.

Equipment & Supply News

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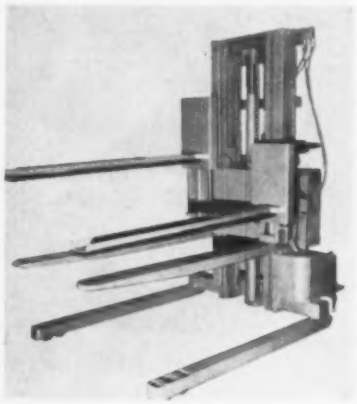
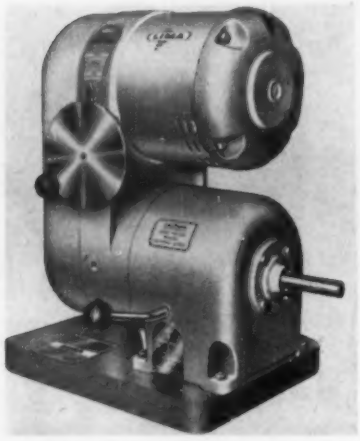
E-25—Drain valve features transparent bowl and drain cock at the bottom. The bowl holds one pint of sediment. The unit has a ½-in. inlet and withstands pressures up to 150 psi. at 120 F. The unit is 5 inches in diameter and 6¾ inches high. Wilkerson Corp.



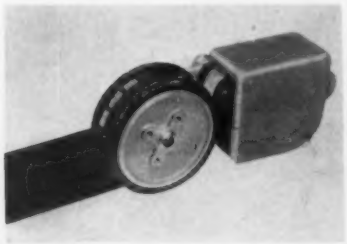
E-26—High-stacking fork lift truck comes with individually operated load stabilizers arms. It can handle large or small loads, or loads of varying heights. The underside of the arms have 1-in. thick rubber to prevent slipping and to protect delicate loads. The unit lifts up to 4,000 pounds at a fork elevation of 108 inches. It runs on a 12-v., 6-cell, 13-plate battery. Lewis-Shepard Products, Inc.

E-27—Air or gas flow meter fully compensates for changes in temperature. This instrument has a center reading flowmeter and features variable sensitivity and range. A wide range of flows can be read at midscale by using interchangeable flow tubes, which range in size from ⅜ to 1 inch. There is no pressure drop in this flow tube, which is designed to withstand overflow or overpressure up to 10 times the normal range. This unit operates on 90 to 135-v. a.c., 60 cycles, and can be panel- or cabinet-mounted. Hastings-Raydist, Inc.

For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.



E-28—Variable-speed drive adjusts from 1,800 to 180 rpm. (using an 1,800-rpm. motor) in steps of 1 rpm. at a time. Unit comes drip-proof or totally enclosed, fan-cooled, with ½-, ¾, or 1-hp. motor. Because the drive incorporates a four-speed transmission, it has a high torque at low speeds. A wheel regulates the rpm., and a pointer, on a scale, shows the exact rpm. Lima Electric Motor Co., Inc.



E-29—Printer, called Fabri-Mark Model 100, marks an indelible identification on the selvage of the cloth or other continuous webs. The unit attaches to any machine and is driven by the contact with the material, requiring no additional power connections. Unit features quick-change printing and inking cylinders. Inks are fast-drying and free of smudge and moisture. Fabri-Mark Corp.

Turn the page

Bondaron, "the leather with the hair on", is the world's best and strongest textile leather.

SKEPTICAL? But don't take our word for it! Send for a free sample of Bondaron leather and apply your own torture tests . . . you'll be convinced. Bondaron won't stretch under exposure to humidity—won't crack under excessive dryness. Bondaron has high tensile strength — great gripping power. It's durable and pliable — with minimum stretch.

Check Bond's complete line of textile loom leathers that have outperformed all comparable products for almost three-fourths of a century: Including:

• Round and flat leather belting • check straps • lug straps • jack straps • loom pickers and other loom accessories.

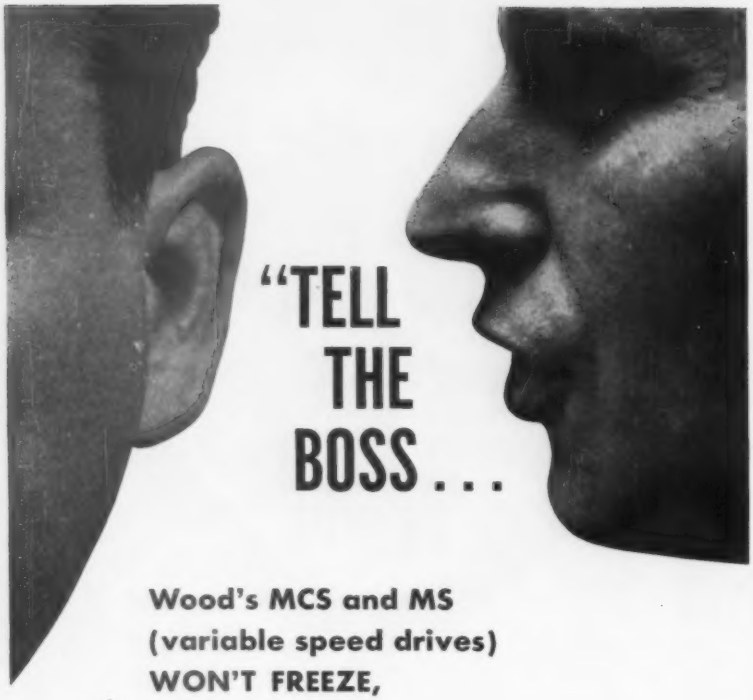
write for free sample of **BONDARON® LEATHER AND TEST IT YOURSELF.**

NAME..... COMPANY.....

ADDRESS.....

Bond **CHARLES BOND COMPANY**

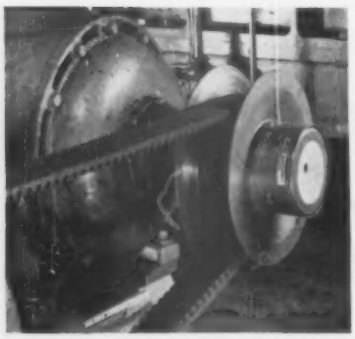
617-23 ARCH STREET • PHILADELPHIA 6, PENNSYLVANIA



"TELL THE BOSS . . .

Wood's MCS and MS (variable speed drives) WON'T FREEZE, WON'T STICK"

And, remind him that Wood's MCS and MS motion control drives solve production and maintenance problems no other mechanical variable speed drives can handle. They won't freeze or stick because there are no keys to obstruct lubrication of bearing surfaces. Revolutionary resilient cam followers or pads, located outside the bearing surfaces, permit continuous rotational pumping action, assure even distribution of oil. And, you check lubrication only three or four times a year. Also, Wood's MCS drives hold constant driven speeds under varying torque loads.



Wood's motion control, variable speed drives are available in capacities from fractional to 25 hp. If you and the boss want more information about these remarkable drives, write for BULLETIN 2104.

Woods

T. B. WOOD'S SONS COMPANY · CHAMBERSBURG, PENNSYLVANIA

MCS/2361 ATLANTA · CAMBRIDGE · CHICAGO · CLEVELAND · DALLAS

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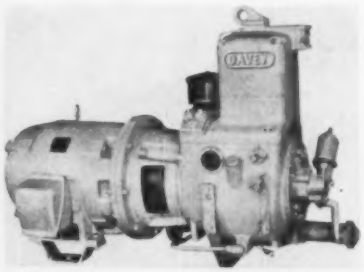
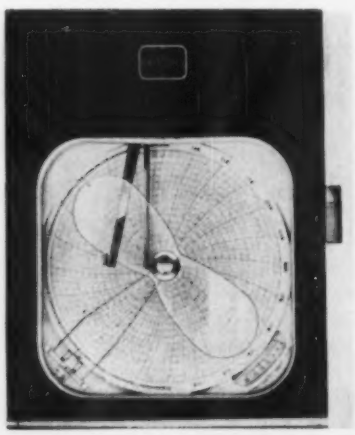


E-30—Rotary compressor features an improved oil separator. A fiberglass filter accumulates fine oil particles, which drain back to the intake section of the compressor through a pressure-reducing valve. Oil in the compressed air is less than one ounce in every 28,000 cubic feet. The units are available in 2 to 125 hp. with capacities ranging from 60 to 60 cfm. Davey Compressor Co.



E-31—Recorder incorporates a time program control unit and the chart recording in one unit. The control-program time may be set from 30 minutes to 30 days. Recording and controlling run independently from separate drives. Various models measure and control temperature, pressure flow, liquid level, or humidity. The unit comes in either pneumatic or electronic control. Bristol Co.

Turn to page 128

Textured Impressions

Fabrics knitted on the Wildman Jacquard JSD circular knitting machine create lasting impressions in the outerwear line. UNLIMITED pattern range enables fabrics to be knitted that are classics in design and texture.

Double piqué . . . Twill Back . . . Blister . . . Rib . . . Tuck . . . Two-Three-Four Color Welt Back Fabrics. Ideal for high production of unique fabrics. Ask for complete details on this new model, the JSD.

WILDMAN JACQUARD

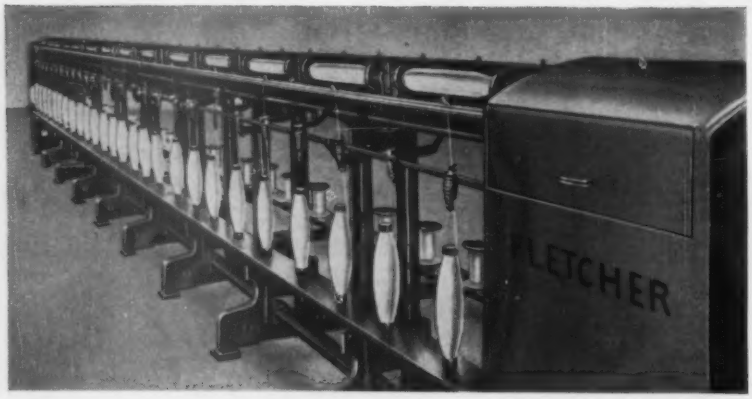
WILDMAN JACQUARD CO. • 1210 Stanbridge St. • Norristown, Penna. • Manufacturers of HEMPHILL BANNER Knitting Machines

A subsidiary of Draper Corporation, Hopedale, Mass.

The only circular knitting machine using a true Jacquard patterning mechanism.

FLETCHER

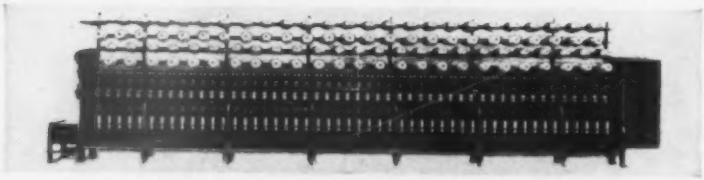
high speed WINDER REDRAW
FOR GLASS AND SYNTHETIC YARNS



Here's the most modern redraw machine, Fletcher-engineered to give you top production.

- Vibration free operation
- Perfect wound bobbins at higher speeds
- Cleaner yarn because of no lubrication in the yarn area
- Three styles of bobbins, all sizes
- Higher speeds. 500 to 750 ypm on 2-pound bobbins.
- Pirns, bottle bobbins and Spools

TRY BEFORE YOU BUY with 3-month trial rental plan

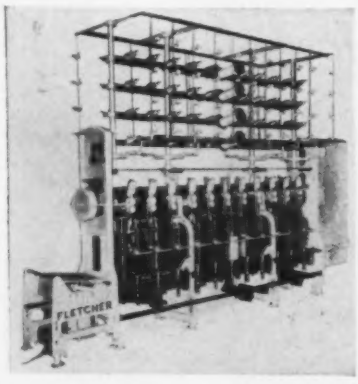


The MASTER DUPLEX *Unsurpassed for glass fibers*

New precision-built machine has speeds up to 9,000 rpm doubling, twisting and novelty for all yarns—glass, synthetic or natural.

FLETCHER BIG 6 POUND PACKAGE JUMBO DUPLEX DOUBLER TWISTER

Six pounds of continuous twisted and double high quality glass, textured, synthetic and cotton yarns. Bottle Bobbin, Straight or Tapered Pirn Package. 22-spindle and 72-spindle 6" ring. 9-inch and 10-inch traverse.



FLETCHER INDUSTRIES

Hasbrook Avenue and Beecher St., Cheltenham, Pa.

FLETCHER SOUTHERN — SOUTHERN PINES, N. C.

FLETCHER INDUSTRIES — STATESVILLE, N. C.

Equipment & Supply News

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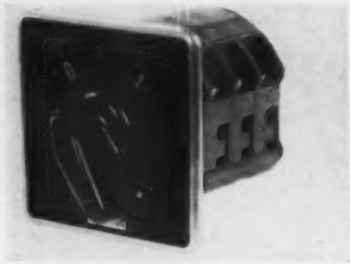
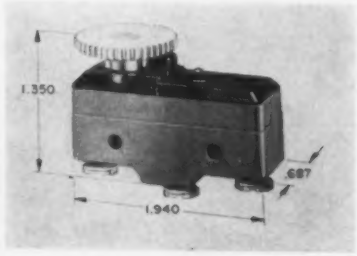
For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.

E-32—Razor-blade knives come with a long handle. When dull, because of the low replacement cost, they can be discarded. This saves downtime needed for sharpening knives. The knives measure five inches long, have a two-in. cutting surface. Edmund Scientific Co.



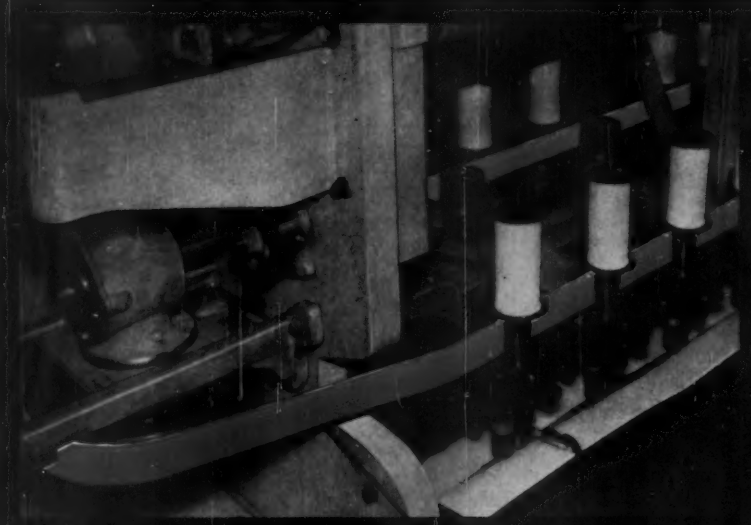
E-33—Motor-protection switch is designed for motors of 1 hp. or less. It operates at voltages up to 440 at 0.07 amperes. When an overload occurs the handle moves 90 degrees and can not be reset until the overload is removed. The unit has a thermal time-delay to prevent trip-out because of momentary overloads. The switch is designed for flush or enclosure mounting, measures 4x4x3¼ inches. Wood Industries, Inc.



E-34—Adjustable switch permits variation of differential travel within a range of 0.0025 to 0.007 inch. The release force stays constant at 10 ounces over the complete range. This adjustable switch permits precision control of on-off cycles for such items as pressure controls or blower fans. It's rated for 20 amperes at 120, 250, or 460 v. Micro Switch Div., Minneapolis-Honeywell Regulator Co.

Turn to page 130

MODERN EXTREMULTUS BELTING



MAINTAINS CONSTANT SPINDLE SPEED

For increased power transmisison belt efficiency use EXTREMULTUS on these textile applications tool

- WINDERS
- WOOLEN CARDS
- COTTON CARDS
- AUTO LEVELLERS
- PICKERS
- SPINNING FRAMES
- ROVING FRAMES
- OPENERS
- LOOMS

TWISTERS

INCREASE PRODUCTION Extremultus belting will not stretch . . . will not slip . . . even on starting. This enables you to maintain constant spindle speed on twisters for more production . . . every day. Constant spindle speed means better build up . . . uniform twist.

REDUCE MAINTENANCE Because Extremultus will not stretch you eliminate costly downtime for belt take-up, or replacement. Extremultus also reduces bearing loads and will outlast all other belting, eliminates lap failures.

(Even oil from spindle will not cause Extremultus to slip)

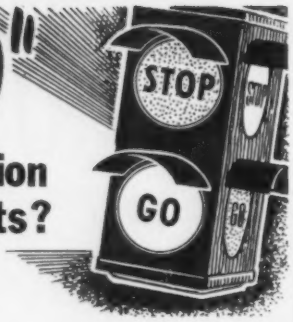
Write for Extremultus catalogue and the name of your local distributor. Ask him to *prove* what Extremultus can do on the drive you select.

THE BEST DRIVE AT THE LOWEST COST

EXTREMULTUS, INC.

25-11 40th Avenue, Long Island City 1, N. Y.

IS
"STOP and GO"
Production
Robbing You of Profits?



"Stop-and-go" production of cloth is costly . . . and unnecessary when the stoppages are due to the fabric guiders. No two fabrics can be handled exactly alike. But you can eliminate a lot of time and expense by installing

MECHO AIR GUIDERS

With Mecho on the job, you can quickly adjust for the lightest fabric or #8 duck *while in operation*. Once set, it will maintain constant cloth alignment and guide within 1/8 inch. It can't spatter or turn a double edge . . . and there are no weights or levers to fuss with. No repair problems, either.

Write today for this helpful FREE Mecho Air Guider Catalog.

THE Guider SPECIALTY COMPANY

372 State Street, North Haven, Connecticut
Southern Representatives:
McSpadden Scantland and Hunter, P.O. Box 3635, Charlotte 3, N. C.

CIRCLE 250 ON READER SERVICE CARD

J. E. CARROLL & CO.

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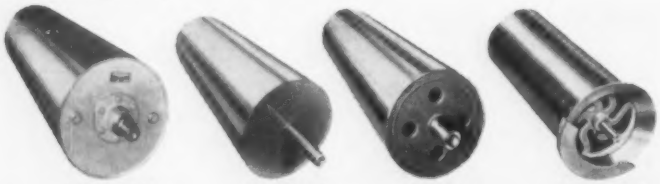
WE MAKE THEM ALL

CYLINDERS FOR HEATING, COOLING, CURING, MEASURING AND WINDING OF TEXTILES, PLASTICS, FLOOR COVERINGS, PAPER PRODUCTS, COATED MATERIALS.



DRYING OR COOLING | MACHINED SHELL | JACKETED TYPE | OPEN END COOLING

HOT OIL OR COOLING | CURING OR WINDING | STEAM SLASHER TYPE

A COMPLETE LINE OF CYLINDER FINISHING EQUIPMENT

J. E. CARROLL & CO. LOWELL, MASSACHUSETTS

Equipment & Supply News

. . . *Begins on page* 113

E-35—Explosive actuated valve, called Con-O-Pack, works on fire-extinguishing systems, control valves, and pneumatic actuators. The unit uses compressed nitrogen and is fired by the current from a 1½-v. battery. Standard valves are 6½ inches long, hold 3 cubic inches of gas and weigh 5½ ounces. The control unit operates at temperatures ranging from —65 to 160 F. Conax Corp.

E-36—Flexible shafts come in sizes ranging from 0.15 to 0.50 inches. These units are suitable for prototype or medium volume requirements where only limited quantities of flexible shafts are needed. Designed for high-speed continuous use, the shaft can be used in either direction. These units are adaptable for power transmission or remote control applications. S. S. White Industrial Div.

For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.

E-37—Constant voltage instrument eliminates the need for manual standardization, standard cells, or batteries. It replaces the battery in a potentiometer recorder. This unit operates from 100 to 135-v. a.c., 50- to 60-cycle current. When used on a bridge circuit power supply, there is very little degrading of voltage regulation. The regulator measures 2½x2½x4¼ inches. West Instrument Corp.

E-38—Compressed air regulator has a quick-adjusting control lever. One full turn (360°) adjusts the regulator from 0 to 60 psi. The maximum inlet pressure is 300 psi. with a maximum outlet of 125 psi. The unit is available in 2 gage ports (or 3 outlets) in self-relieving or nonrelieving types. The regulator uses a nylon reinforced diaphragm. Wilkerson Corp.

Turn the page

SEWING MACHINE SUPPLIES

1 2 3 4 5

HOOKS—The important part of a Chain-stitch Sewing Machine is the Hook or Looper. A slight deviation in the shape of the hook, either at the point or heel, will cause much trouble. Tempering of the hook is also important, as the point will be easily broken if too hard, and will soon wear out if too soft. Our hooks are made from a steel forged blank made from special steel with proper temper and high finish. The cut above represents five types of loopers.

No. 1. A left-hand Singer type Looper.
No. 2. The regular left-hand Dinsmore Looper.
No. 3. The regular type right-hand Singer Looper.
No. 4. A long throw Looper used on some types of machine.
No. 5. Standard Dinsmore Looper, made especially for use on our machines.

NEEDLES—Much time is lost and annoyance caused by inferior needles. We have our needles made especially for us by one of the largest needle manufacturers in the country, with a point particularly adapted to the class of work for which our machines are used, with a perfect eye which will not cut the thread, finished smooth and properly tempered.

THREAD—To give the best results, to use a thread that is adapted to the class of goods to be sewed. We have made for us, thread of various sizes and numbers, either 3, 4, or 5 ply of proper strength, free from bunches or knots, with smooth finish. We can quote low prices for the quality we offer.

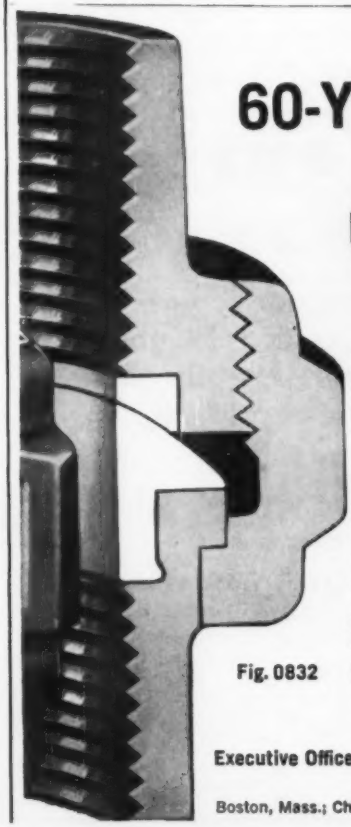
RESULTS—The best finishing results will be obtained by using genuine Dinsmore Loopers and Needles, as they are particularly adapted for our machines. Counterfeits often cause serious troubles and delays.

REPAIRS—We are prepared to undertake the repairs of all makes of Sewing Machines. We have the necessary special tools and skilled mechanics for this class of work. We guarantee repairs entrusted to us.

DINSMORE MANUFACTURING COMPANY

BOX 267 SALEM, MASSACHUSETTS

CIRCLE 251 ON READER SERVICE CARD



60-Year Guarantee Backs Dart Unions

For over 60 years every Dart Union has been backed by the firm GUARANTEE that "if one should leak through, we will give you two". Less than 1 in every 100,000 has proven faulty.

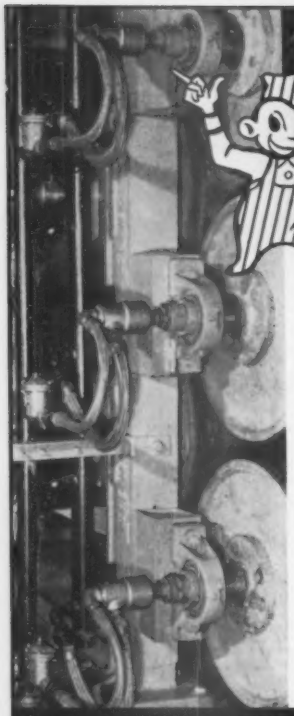
The extra wide bronze seats, ground on specially designed machines to a true ball and socket joint, are swaged under heavy pressure into air-refined malleable iron bodies. They come apart readily and remake repeatedly without excessive wrenching — without jamming. They are the reason that Darts may be used over and over again.

Sizes: ⅛" thru 4 inches
Pressure ratings: ⅛"-2"— 300 S.W.P., 600 W.O.G.
2½"-4"— 250 S.W.P., 600 W.O.G.

Fig. 0832 **Darts also available in the all-iron construction.**

THE **Fairbanks** COMPANY
Executive Office: 393 Lafayette Street, New York 3, New York

Branch Offices:
Boston, Mass.; Chicago, Ill.; New York, N.Y.; Pittsburgh, Pa.; Rome, Ga.



The ROTARY UNION* the trouble-free rotating seal

The Rotary Union automatically compensates for fluctuations in line pressure and always delivers the correct amount of heating or cooling gases or liquids to revolving equipment. The Rotary Union requires no adjustments or mechanical maintenance and thus saves on labor and down-time. Its floating action protects its optically flat sealing surfaces from stress and strain and assures extremely long leakproof service. Also shown is the Unitrap Model 70T which gives you faster warm up and efficiently removes condensate.

For long, accurate, and trouble-free service, standardize on the Rotary Union. Pipe sizes ¼" through 5". Write for Bulletins 700 and 800 today.

*Trade Name—Patented

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PERFECTING SERVICE COMPANY, 332 Atando Ave., Charlotte, N.C.

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CIRCLE 252 ON READER SERVICE CARD

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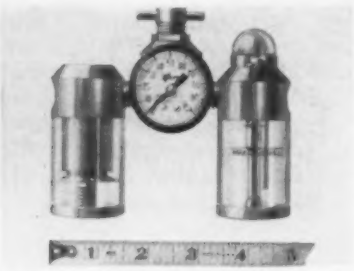
Equipment & Supply News

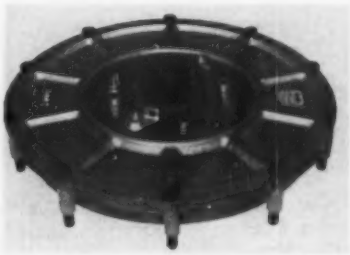
. . . *Begins on page* 113

For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

E-39—Cotton-bale clamp, for hydraulic lift trucks, now comes in three sizes. Clamps are available with maximum openings ranging from 67¼ to 90 inches. These units are designed to fit the 2000- to 5000-lb.-capacity lift trucks. Hydraulic cylinders are self-aligning, and the arm carriers are equipped with nylon bushings. These bushings eliminate the need for field lubrication. Cascade Mfg. Co.



E-40—Air line filter-regulator-lubricator assembly combines these three operations into one compact unit. It's available in ⅛- to ¼-in. sizes with maximum pressure ratings up to 150 psi. The filter features a 20-micron porous-bronze element. Watts Regulator Co.



E-41—Air clutch and brake, called Power Flow, features adjustable, self-centering torque plates. The silicone-rubber diaphragm resists temperatures up to 600 F. Units are now available in 16- and 18-in. diameter. Mid-States Industrial Clutch Co.

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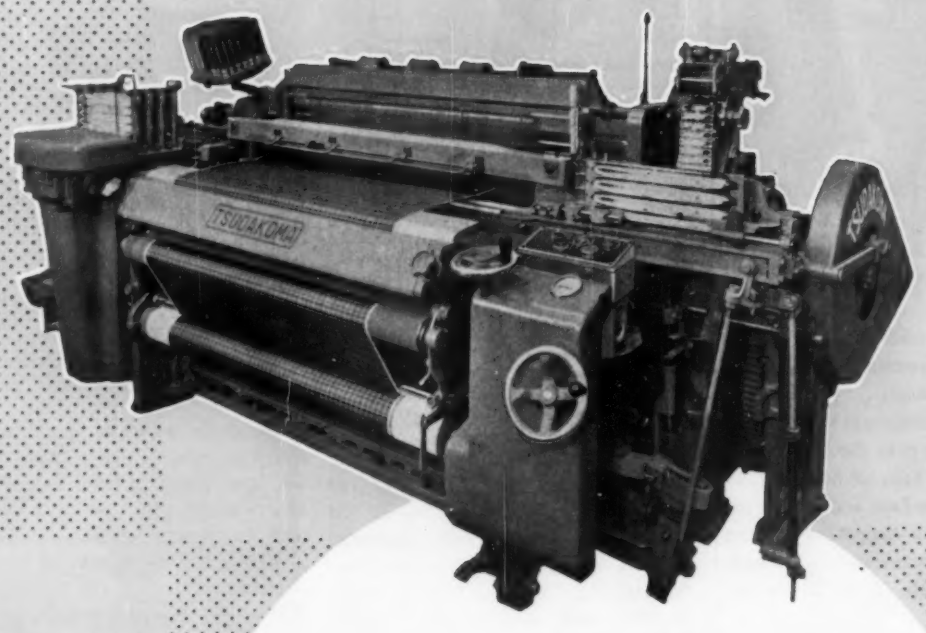
Tsudakoma



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(for Silk, Rayon, Nylon and all Synthetic Yarns)

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High Speed Bobbin Winder
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High Speed Sectional Warper
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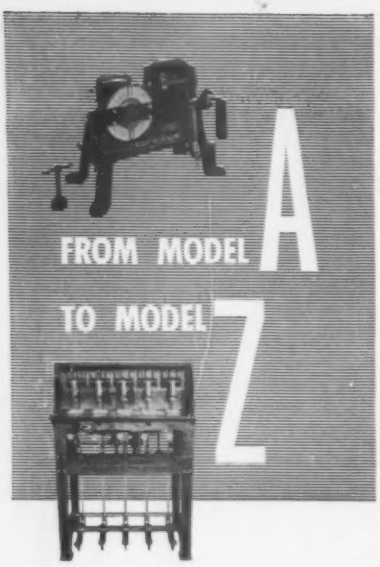

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Whether you own a Scott tensile tester, a Scott Mooney Viscometer, or *any* other Scott Tester equipment . . . you can now get *certified* maintenance at very reasonable cost *anywhere* in the continental U. S. and Canada. Take advantage of the latest factory know-how and techniques to keep your testing equipment working properly and economically. Scott field men offer complete A to Z service, including:

• Inspection • Adjustment • Calibration • Minor Repairs • Work Report • Certificate of Calibration (often required on Government contracts)

Select either of two Scott Tester service plans:

(1) "GROUP SERVICE" PLAN

Regularly scheduled service trips are made from Spartanburg, S. C. and Providence, R. I. on a fixed fee basis.

(2) INDIVIDUAL SERVICE PLAN

For immediate service, or when service is required other than during scheduled group trips. Special rates quoted upon request.

(NOTE: Models CRE, ACCR-O-METER, STI and RMA are serviced only on special order.)

Write or call for complete information. Scott Testers, Inc., 95 Blackstone St., Providence, R. I.

SCOTT TESTERS

THE SURE TEST . . . SCOTT!

E-42—Table-top printer, for small-quantity printing, handles all printers' colors. Ordinary typewriter mimeograph stencils may be used for printing letters. No wash-up is needed, ink is removed by a simple blotting process. Identification Systems Co.

E-43—Heavy-duty water-softener systems are now available for industrial use. The BD Model comes in four sizes, ranging in capacity from 40 to 100 gpm. These softeners use Permutit Q resin without subfill, which eliminates the possibility of upsetting the resin bed. Prepackaged units make installations simpler. They include the Multiport valve. Permutit Water Conditioning, Inc.

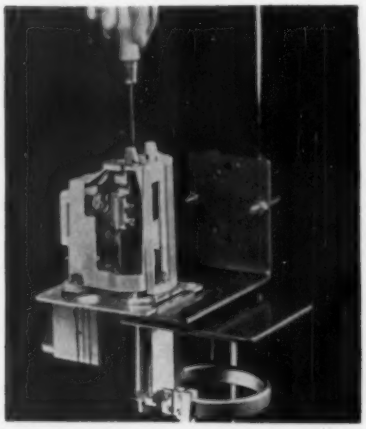
E-44 — Vacuum breakers use a molded polyethylene poppet and a raised check valve to assure rapid and positive closure. Two types are available: No. 710 in sizes up to 2 inches takes 150 psi at 150F, and No. 715 for ½- and ¾-in. lines takes 150 psi at 250F. Febco Inc.

E-45 — Submersible a.c. motors come in sizes ranging from ½ to 40 hp. These motors operate in any depth of water, oil, or chemicals and are pressure-proof. The cast-iron frame and mounting base is corrosion resistant. Oil filled at the factory for bearing protection, the unit is permanently lubricated. Motors are rated for continuous use in liquids at 40C. Reliance Electric & Engineering Co.

E-46—Cutting die is designed to meet ASTM standards. The latest die in the series is one that cuts samples for the Monsanto crease-recovery test. These units feature the original NAEF expulsion type die for making exact sample dimensions. SMS Instrument Co.

For more information on any of these items, circle appropriate number on the Reader Service Card, next to the back cover.

E-47 — Flooring-repair material, called Swift Floor, now has double its former strength due to an ionization process. It takes loads up to 50,000 pounds 60 seconds after it is applied. The material works on concrete or wood surfaces for such areas as ramps, warehouses. Monroe Co., Inc.



E-48—Pressure transmitter has a 1 to 10 span suppression for accurate measurement of small pressure increments. It is available in five ranges up to 7,500 psig. On the 1,000 psig. instrument the range span can be as small as 60 psig. or as large as 600 psig. The force balance systems use a Bourdon tube for great accuracy. It's calibrated to 0.05% accuracy of the metered range. Bailey Meter Co.

E-49—Vibrator conveyor uses compressed air (10 to 100 psi.) for power. The unit (which prevents contamination and dust) is totally enclosed. Mounted on coil springs to isolate vibrations, the vibrator works on conveyors up to 20 feet long. It has a 6-in.-dia. tube that is three feet long. The piston inside the cylinder, the only moving part, is automatically lubricated. Because the equipment has only one moving part, maintenance is kept to a minimum. Material flow is regulated by an adjustable air valve. Cleveland Vibrator Co.

E-50—Stainless-steel beaker filters use two types of stainless steel. Type 304 stainless-steel tubes are welded to the center of a type 316 porous stainless filter dish. The filters are available in five ranges of porosity with average pore openings of 65, 35, 20, 10, and 5 microns. The units withstand temperature to 400 C. and are chemically resistant to all alkalis and almost all acids. Pall Corp.

E-51—Hanger bracket is designed for use with Shure-Set ¼-in. threaded studs imbedded in concrete or steel. The bracket, No. 1,240, can be used to hold lighting fixtures, ceiling frameworks. It has large side slots for easy and quick threading of the drop wire. Winchester-Western Div., Olin Mathieson Chemical Corp.

E-52—Tool Stand comes with four drawers. Each drawer has recessed handles, padlock attachments, sliding tray. The work top can be reversed, providing a work-tray with ½-in. flange on all sides. The unit, mounted on swivel-type casters, has 5-in.-dia. wheels. Overall size is 22½x20½x34 inches. Drawers are 21¾ in. wide, 20 in. deep, and 6¾ in. high. Lyon Metal Products, Inc.

Turn the page

static

ends with the Simco "Midget"

This electronic static eliminator is *unconditionally guaranteed* to end all static problems . . . safely, inexpensively . . . the most effective neutralizer available for use on cards, garnetts, warpers, slashers, finishing machines, and all other textile applications. The "*Midget*" assures static-free warps and slivers every time. Simco is America's largest manufacturer specializing in static neutralizers, anti-static cleaning devices and sprays, and meters for locating and measuring static.

Equip your machinery now.

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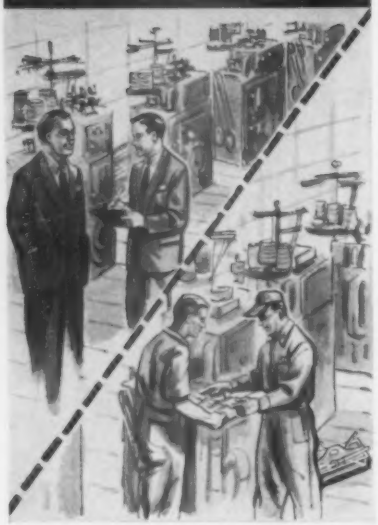

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DOWNTIME IS EXPENSIVE . . .

A machine lost to downtime can mean a serious break in your production schedule. Ives replacement parts represent one of your best safeguards against the crippling effects of lost production.

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TEXTILE WORLD . . . New Literature

For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.

ELECTRICAL

L-1—Better Power for Production, a well illustrated 48-p. manual, covers the planning of industrial power systems. Partial contents: choosing voltages, short circuit calculations, protective relaying. General Electric Co.

L-2—The Electrionics Handbook covers the use of electric and electronic controls in commercial and industrial air conditioning. Theory of control is explained, and comparison made with pneumatic controls. Barber-Colman Co.

L-3—Electric Motor Maintenance discusses a complete maintenance program from how to start one to suggested service record forms. Upkeep of each operating area of a motor is fully explained and illustrated. Allis-Chalmers Mfg. Co.

L-4—Voltmeters and ammeters with 180 degree scales for switchboard mounting are presented in a 4-p. bulletin, GEZ-3109. Electrical data and descriptions are spelled out, detailed diagrams show sizes and various connections. General Electric Co.

L-5—Electrode glands for pressure sealing electrical leads into machines operating up to 2500 psi., at temperatures from —300F. to 1,850F., are shown in Catalog 960. Tables give specs and prices of all types. Conax Corp.

L-6—Electro-finisher for knitted and woven woolens, wool blends, and high-pile acrylic fabrics has each major component illustrated and described in a 4-p. foldout. Operation of the machine and components is spelled out. Turbo Machine Co.

TEXTILE MACHINERY & AUXILIARY EQUIPMENT

L-7—Modular benches in a choice of widths are featured in a 3-p. catalog. Complete information (with pictures, descriptions, and price lists) on bins, cabinets, shelving, stock carts, and accessory equipment. Bay Products, Inc.

L-8—Vibration dampening mounts for use where safety codes require bolting machines to the floor are described in a brochure. Full specifications and positioning procedures are included. Clark-Cutler-McDermott Co.

L-9—Parts-cleaning machine that uses chemicals is described, with suggested applications, in a leaflet. A photograph of the cleaner and an exploded view illustrate the page. Operation is briefly described. Pall Corp.

L-10—Special-purpose card feeders, 21 in all, are pictured in a 4-p. brochure. Feeders for wool, asbestos, rayon, jute, cotton, and man-made-fiber staples are included, along with brief descriptions of each. S. Harwood & Sons, Inc.

L-11—Fibre Glass Textile Yarn tells the story from raw materials to finished products in 11 pages. A fiber-comparison chart and a yarn comparison table, for continuous-filament yarn, lists technical data. Johns-Manville Co., Fibre Glass Div.

L-12—Cast-tooth sprockets, ground to fit the chain, are tabulated in a 12-p. guide, No. 2867. There are 132 chain numbers listed and cross-referenced to 48 sprocket lists. Link-Belt Co.

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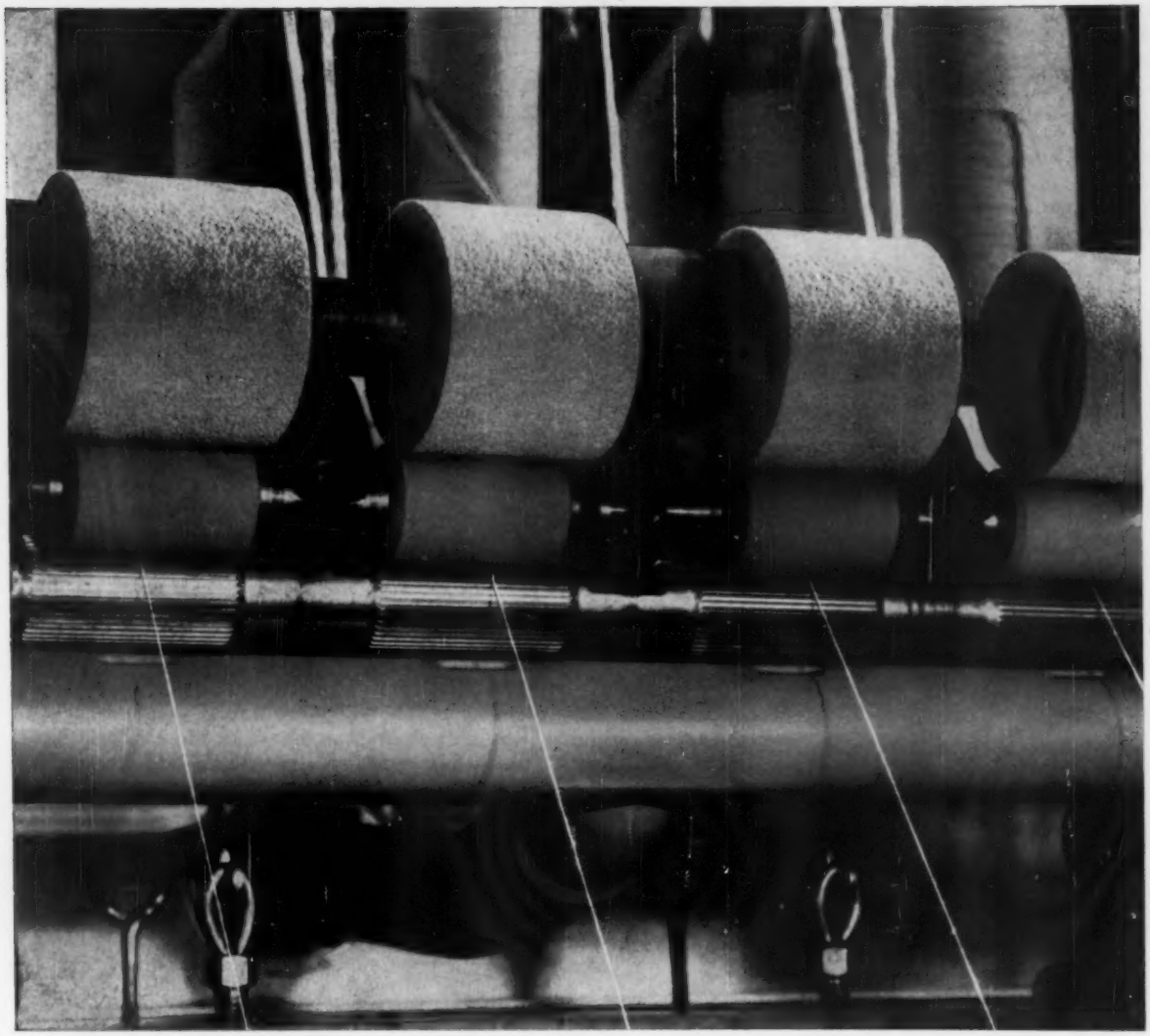

Save up to 50% in clearer picking and maintenance costs with this new cover

Accotex NK-770, an expanded rubber clearer cover developed by Armstrong, allows you to pick on the frame. Waste is collected evenly in a single piece . . . and can be removed with a quick motion of the hand, eliminating mechanical cleaning. These new covers last at least three times as long as conventional materials, yet they cost no more. In addition, many mills have found that NK-770 covers allow them to lengthen picking intervals and reduce picking crews. All these economies can add up to a 50% saving in clearer picking and maintenance costs. We'll prove it on your own frames. Ask your Armstrong man to arrange for a test installation. Or write for additional information to Armstrong Cork Company, 6901 Dauphin Street, Lancaster, Pennsylvania.

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... the deep **BLACK**

... the clean **BLACK**

... the uniform **BLACK**

... the low-cost **BLACK**

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... the simple dyeing method for nylon, silk, and wool

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374 MAIN ST., BELLEVILLE, N. J.

The West Indies Chemical Works, Ltd.
70 Wall St., New York 5, N. Y.

NEW LITERATURE

... *Begins on page* 136

For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.

L-13—Fiber facts come in a pocket-sized, 72-p. handbook. Partial contents: guide to man-made fibers, physical properties of man-mades, glossary of textile terms, spinning twist calculator, denier conversion. American Viscose Corp.

L-14—Starch converter for preparing warp sizes from unmodified corn starch is introduced in an 11-p. publication. The converter itself and sizing with the converted starch are fully discussed. Illustrated. A. E. Staley Mfg. Co.

L-15—Rotary cutters and winders that operate with seam detector, yardage meter, and pre-set control are featured in 4-p. bulletin. The machines are shown in operation, with typical winding set-ups. H. W. Butterworth & Sons, Inc.

L-16—Roving-frame and room cleaners are pictured in a two-color circular. The illustrations show frame- and ceiling-mounted cleaners in actual plant installations. Included is a description of operation. Parks-Cramer Co.

ENGINEERING

L-17—Base-mounted pumps with split cases are described in a leaflet. A completely detailed cutaway drawing shows all parts. Specifications for engineers and architects are listed. Aurora Pump Div., New York Air Brake Co.

L-18—Infra-red burner information comes in two sheets. The first describes infra-red and outlines its industrial use. The second gives detailed technical information, with selector tables. Bryant Industrial Products Corp.

L-19—Bronze ball valve for a wide range of uses is discussed in Circular 611. Specific design features, dimensions, and ratings are set out, along with suggested uses. Cutaway view shows unit's construction. Lunkenheimer Co.

L-20—Storage water heaters, a new line in 55 horizontal and vertical sizes, are introduced in an 8-p. catalog. Tables allow quick determination of hot-water demand, give choice of unit and heating element. Niagara Weldments, Inc.

L-21—Rolls of all types, with stub and through shafts, are diagramed in a 4-p. foldout. Photographs show different kinds of rolls in stages of manufacture. Included is a description of self-aligning rolls. Barclay Machine Co., Inc.

L-22—Analysis of tubing and pipe in carbon, alloy, and stainless steel, especially for corrosion resistant or high-pressure service, is quickly determined with the charts in a 4-p. folder. ASTM specs by number. Babcock & Wilcox Co.

L-23—Steel storage racks are described in a data sheet. Photographs and drawings show a number of possible applications. All models, with both vertical and horizontal frames, are tabulated. Aacon Unitary Storage Equipment Co.

L-24—Steel conveyor drive of linked plates for handling many kinds of material is discussed and pictured in a bulletin. Charts list all dimensions of the system, along with strengths, weights, and prices. Maurey Mfg. Corp.

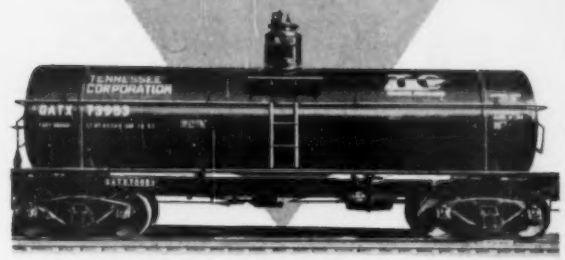
CHEMICALS AND SUPPLIES

L-25—Eleven oils recommended for hydraulic and circulating systems operating below 120F. where oil is constantly replaced, or with Fuller's-earth filters, are described in a data sheet . Physical properties are discussed. Sun Oil Co.

L-26—Coconut Fatty Acids, 8-p., covers caprylic, capric, lauric and myristic acids, coco acids and a capric-myristic blend. Specifications of these neo-fats as determined by

Turn to page 140

SULFURIC ACID



A BASIC PRODUCER FROM MINE TO FINISHED PRODUCT SERVING THE GREAT SOUTHEAST

The Sulfur contained in the ore we process yields Virgin Sulfuric Acid of highest quality—We produce all grades and strengths of Sulfuric Acid from 60° Baume through the various Oleums.

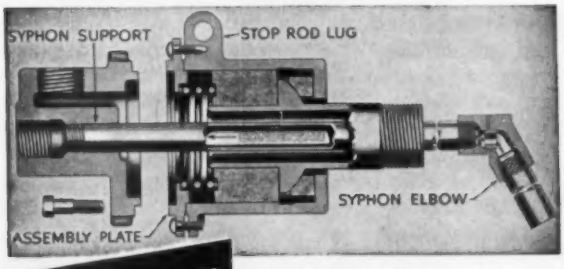
Call JAckson 3-5024, Atlanta, Ga., or write:

TENNESSEE CORPORATION
612-629 Grant Building, Atlanta 3, Georgia

CIRCLE 257 ON READER SERVICE CARD

TRY THIS on your Dry Cans and 30" Slasher Cylinders

We'll gladly furnish a pair of these units for 90-day obligation-free trial in your mill. The Type SB2P is self-supporting, completely packless, needs no lubrication or adjustment. The Johnson Syphon Elbow permits the use of two straight pipes instead of an unwieldy curved syphon pipe, is hinged to pass right through the joint.



Johnson ROTARY PRESSURE Joints
First in the Textile Industry

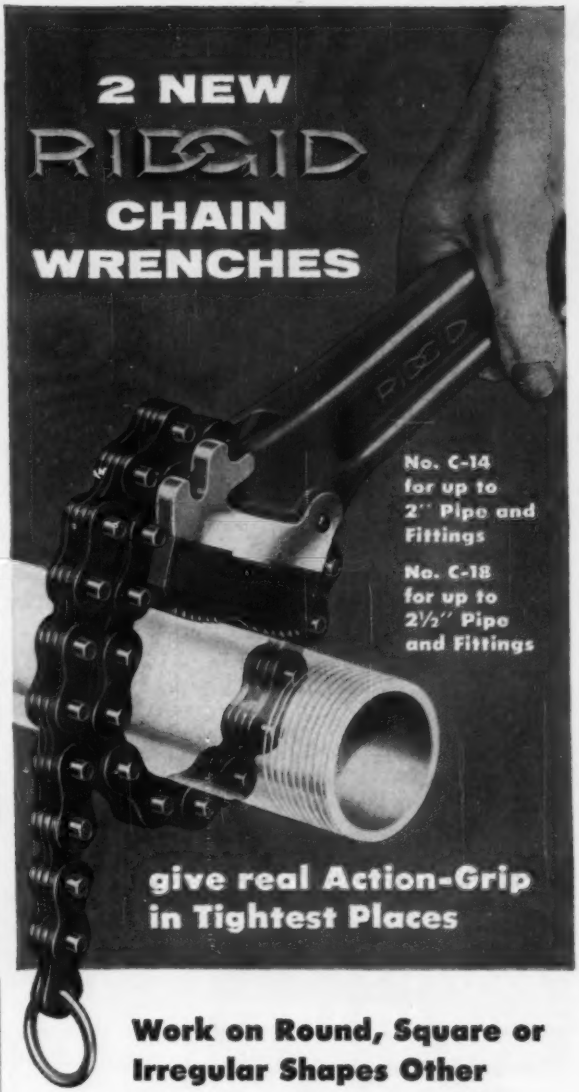
Write for Catalog S-3002

Shows self-supporting Johnson Joints for all needs . . . on print cans, calenders, compressive shrinkage ranges, big 5' and 7' cotton slashers, dry cans, etc.

THE JOHNSON CORPORATION
814 Wood St., Three Rivers, Mich.

CIRCLE 259 ON READER SERVICE CARD

2 NEW RIDGID CHAIN WRENCHES



Work on Round, Square or Irregular Shapes Other Wrenches Can't Reach!

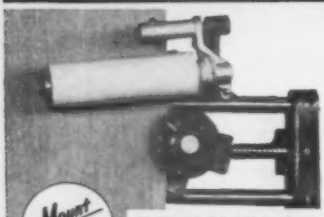
In extra close quarters, there's nothing that'll beat these new RIDGID Chain Wrenches for getting the job done. Fast, ratchet-like action in either direction . . . from either side. Give tight grip without crushing. Large, easy-to-grab end ring for fast chain adjustment. Tempered steel chain locks securely . . . releases quickly. Rugged, comfort-grip, I-beam handle, guaranteed not to break or warp . . . handy hang-up hole.

Light and easy to use, these new RIDGID Chain Wrenches do everything a regular wrench can do . . . and much more. Call your Supply House and get one today!

RIDGID
The Ridge Tool Company • Elyria, Ohio, U.S.A.

CIRCLE 139 ON READER SERVICE CARD

MORE THAN WATCHDOGS of Misalignment . . .



PRECISION GUIDERS

Like watchdogs — Mount Hope Precision Guiders instantly detect misalignments — and automatically correct these deflections, control lateral movement of the cloth.

As material begins to move out of alignment, it is "sensed" by a grooved and fluted selvage wheel which automatically readjusts the angle of a pair of nip rolls on each selvage. This ever-changing angle compensation applies just the right pull to keep the finest fabrics or the sturdiest materials in alignment.

For more information write to:

MOUNT HOPE MACHINERY COMPANY

50 Fifth Street, Taunton, Mass.
Plants at Taunton, Mass. and Charlotte, N.C.

CIRCLE 253 ON READER SERVICE CARD

GREATER PROTECTION To your AIR LINE!

M-B

AUTOMATIC WHIRL-A-WAY AIR LINE FILTER MODEL W-1 and TRAP

RIBBON TYPE FILTERING UNIT removes solids .00039 and larger. Transparent plastic bowl makes filtered foreign matter visible. Gives maximum protection to all types of Lint blowers, Blow-off Hoses and various air-operated controls.

The TRAP ejects water automatically. Operates upon accumulation of 3 to 4 ounces. Discharges in less than 5 seconds. Assures dry air in pneumatic system at all times. Non-corrosive throughout.

M·B PRODUCTS
46 VICTOR AVE., Div. 11
DETROIT 3, MICHIGAN

NEW LITERATURE

. . . *Begins on page* 136

For more information on any of these items, circle appropriate number on the Reader-Service Card, next to the back cover.

gas chromatography are given. Armour Industrial Chemical Co.

L-27—Rubber guide sets out the properties and limitations of synthetic rubbers and plastics. The 12 pages provide descriptions of the major synthetics, data on maximum temperatures, chemical resistance of materials. Stowe-Woodward, Inc.

L-28—Ethers, a 40-p. manual, describes properties and uses of ethers and glycol diethers. Included—solubilities, specification limits, test methods, storage and handling data, and references. Union Carbide Chemical Co.

L-29—Sulfuric Acid is a 40-p. brochure with many illustrations and graphs. Latest information on all aspects of the acid is given. Also plotted curves calculate reactions when the acid is diluted with water. Allied Chemical Corp.

MATERIALS HANDLING

L-30—Fork lift trucks are treated in a foldout which has many photographs illustrating correct truck uses. The text gives examples of improper uses of trucks and offers tips for best truck selection. Automatic Transportation Co.

L-31—Strapping equipment information comes in a thumb-indexed catalog which discusses steel and rayon strapping and pressure-sensitive tape. Strapping recommendations for all weight and specialty packages. A. J. Gerrard & Co.

L-32—Mounting systems to control vibration, shock, and noise are described in an 11-p. report. Photographs illustrate uses of mounts, and a graph assists in design of suspension systems for shipping containers. Lord Mfg. Co.

L-33—Portable belt conveyors are shown in a 3-p. foldout. Three units (lightweight aluminum, general duty, and heavy duty) are illustrated and explained with detailed descriptions and specifications. Rapids-Standard Co., Inc.

L-34 — Material-handling equipment, carriers, tractors, switches, and other machinery for overhead use are pictured in an 11-p. booklet. Each photograph is accompanied with text and specifications. Cleveland Crane & Engineering Co.

L-35 — Plastic-film wrapping machines for laminated foils, cellophane, and soft plastic films are described in a 4-p. data sheet. Size capabilities of the machines are listed, with technical data. Battle Creek Packaging Machines, Inc.

L-36 — Horizontal conveyors are described and illustrated in an 8-p. folder. Five types: Wheel and roller, live roller, belt on roller, table, and turntable are included. Specifications of all types given. Rapids-Standard Co., Inc.

INSTRUMENTS

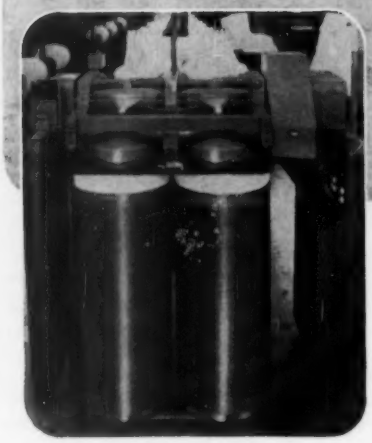
L-37—Recorders and indicators are listed in Catalog C-15-la, which replaces earlier booklet. Photographs of many models, including detailed close-ups, and performance charts, fill the folder. Minneapolis-Honeywell Co.

L-38—Checking calcium presence down to parts-per-million is described in a leaflet. A flow diagram of the automatic analytical system is included, along with several actual chart recordings. Technicon Controls, Inc.

L-39—Pycnometer for air comparison is described, with specifications, and pictured in a brochure. Diagram and text explain the instrument's principle of operation. Possible applications are offered. Beckman Instruments, Inc.

GENERAL

L-40—Wire cloth and screen data is collected in a loose-leaf reference catalog. Four sections give illustrations and specifications of square mesh and opening space cloth, tables for calculating screen use. Cleveland Wire Cloth & Mfg. Co.



Coiling in 15" through 18" diameter cans up to 42" high.

Introducing...

The Ideal Feathertouch '750'

The most efficient super speed drawing ever produced

This two delivery frame produces as much sliver of the highest quality as does the average latest model four delivery frame. The Ideal '750' permits safe, practical, and steady speeds of 750 fpm with far less downtime than is encountered with four delivery frames. It saves on original investment, saves floor space, and drafts all fibers and blends.

Write today for full information on the extremely efficient Ideal Feathertouch '750'.

Ideal Industries, Inc.
Bessemer City, N. C.

THE ORIGINATORS OF HIGH SPEED DRAWING

What Do You Know About People?

What about problem employees, or committees, or morale? As much as you may know at first hand, chances are you could profit by knowing still more.

That's why you'll find three of TEXTILE WORLD's editorial reprints especially helpful in your job as manager of people.

Take a look at these recent article reprints:

1. **Your Problem Employees —How to Spot Them and How to Handle Them.** Want a quick definition of a problem employee? He's the man who costs you money . . . the man who's responsible for lost orders or jumbled inventory. Circle A-17, Reader - Service Card, next to back cover.
2. **7 Rules of Committeemanship**—How can you make the most of management by committee? How do you shine without disturbing the teamwork concept of management? These seven tips, says management expert Auren Uris, will point the way for you . . . will lighten your load, increase your effectiveness as a manager. Circle A-27, Reader-Service Card.
3. **Why You Should Make an Employee Attitude Survey**—To compare elements of morale, spot company strong points, or chart progress from year to year, there's nothing like an attitude survey among your employees to help you get firsthand evidence of just what kind of job you're doing as a manager. Circle A-29, Reader-Servive Card.

TEXTILE WORLD

To get items you want offered in the advertisements in this issue, just circle numbers on Reader-Service Card next to the back cover. If all bulletins listed under one number are not required, please write on card the name of bulletin desired.

Advertisers' Literature

A350—Rotary Pressure Joint. Send for Catalog No. S-3002, which describes applications. Johnson Corp.

A351—Variable-Speed Drives. Technical Bulletin No. 2104 lists types and uses. T. B. Wood's Sons Co.

A352—Valves. Ask for Catalog No. 60, which describes complete line of valves. Crane Co.

A353—Loom Efficiency Calculator. Write for this easy-to-use efficiency calculator. Veeder-Root

A354—Over-head rail. Details of Monorail Rail available in an 8-p. bulletin. American Monorail

A355—Roving Frame. Send for the brochure that details higher-speed operation. Within Machine Works

A356—Rotary Union. Bulletins No. 700 and 800, free for the asking, describes all uses. Perfecting Service Co.

A357—Strapping Calculator. Write for the new calculator that assists in cutting costs on your strapping needs. Signode Steel Strapping Co.

A358—Hydrogen Peroxide Bleaching Process. Bulletin describes details of process and cost analysis. Solvay Process Div.

A359—Textile Leather. Free sample available for you to test. Charles Bond Co.

A360—Stainless-Steel Valves. Catalog listing types available on request. Jenkins Brothers

A361—Caustic Soda. Send for the caustic soda buyers guide. Hooker Chemical Corp.

A362—Screen Printer. Write for illustrated catalog and fabric samples. Edward S. Rudnick

A363—Pyridinium Chloride. Data sheet is yours for the asking. Hooker Chemical Co.

A364—Fabric Guide. A free catalog is available on these air guides. Guider Specialty Co.

A365—Potassium Carbonate. Send for the descriptive data sheet. Hooker Chemical Corp.

A366—Vacuum Collector. Bulletin No. 30A describes machine details. Bahnson Co.

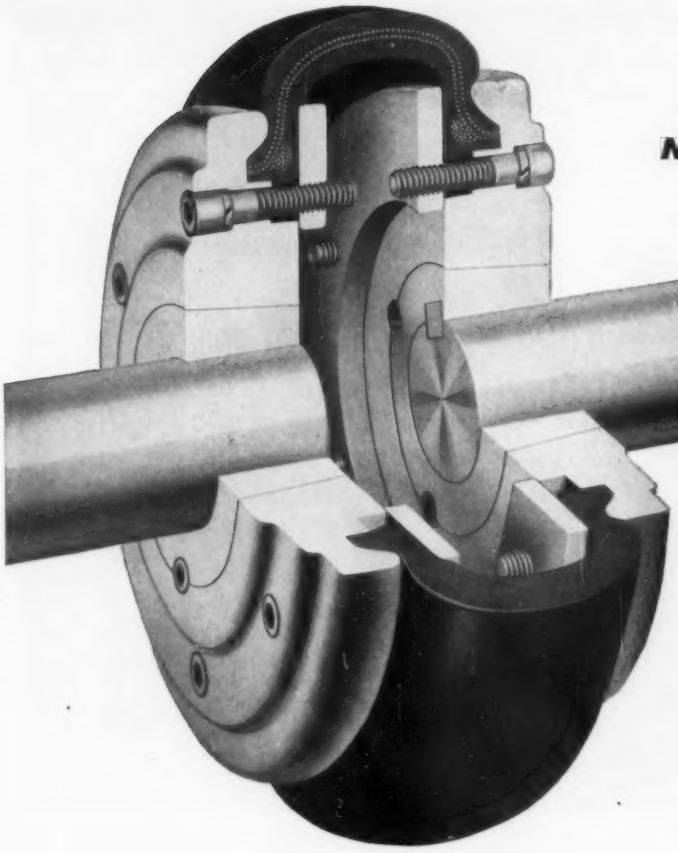
A367—Chlorine. Send for the manual that fully describes the product. Hooker Chemical Corp.

A368—Circular Knitter. Ask for the booklet that has production and machine details. Supreme Knitting Machinery Co.

A369—Oxalic Acid. Data sheet available free for the asking. Hooker Chemical Co.

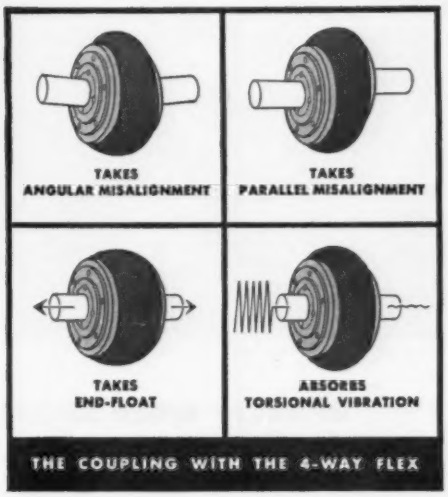
A370—Cleaning Solvent. Write for a free sample and bulletin that describes this odorless solvent. Harry Miller Corp.

A371—Trichlorethylene. Data sheet can be yours by request. Hooker Chemical Corp.



NEW!

DIFFERENT!



DODGE

Para•flex

FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

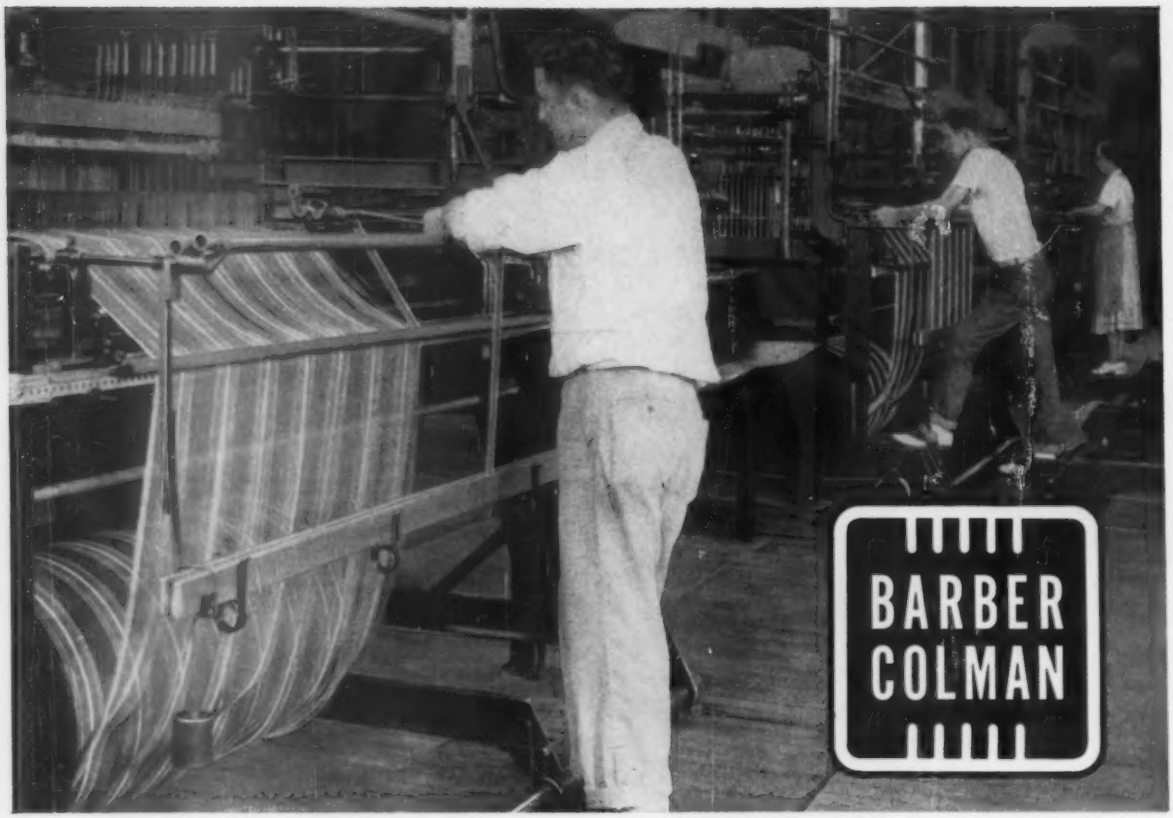
Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 2000 hp at 1080 rpm. Call your distributor for a coupling to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 1400 Union, Mishawaka, Ind.

DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the *white* pages of your telephone directory, or in the yellow pages under "Power Transmission Machinery."



WARP DRAWING MACHINES HELP YOU KEEP AHEAD WITH FAST PATTERN CHANGES

Mills which are running fancy patterns, special weaves, short-order exclusives, or novelties are often bogged down waiting on drawing-in of new warps. The use of Barber-Colman Warp Drawing Machines can greatly relieve such situations because of the ease and rapidity with which new patterns can be drawn. Operating at speeds (depending on conditions) of from 2,000 to 5,000 ends per hour, these machines will draw cotton, worsted, wool, or filament and spun synthetics for plain or dobby weaves from a flat sheet, split sheet, double beam, or one-and-one leased warp. Correct selection of drop wire, heddle, and reed dent for each end is accurately controlled by a metal pattern strip punched in accordance with the designer's draft. Machines are made in several sizes with capacities up to 26 harness frames and 8 banks of drop wires. *For details, see your Barber-Colman representative . . .*

AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • WARP DRAWING MACHINES

BARBER-COLMAN COMPANY

ROCKFORD • ILLINOIS • U. S. A.

FRAMINGHAM, MASS., U. S. A. GREENVILLE, S. C., U.S.A. MANCHESTER, ENGLAND MUNICH, GERMANY

INDIA	MEXICO	BRAZIL	JAPAN	PAKISTAN	PAKISTAN
Batliboi & Company Forbes Street, Fort Bombay, India	J. Rabasa Isabel la Catolica 45-913 Apartado 7348 Mexico D.F., Mexico	Industria e Comercio de Maquinas S. A. Avenida Rio Branco No. 50, Rooms 1201/3 P. O. Box No. 63 Rio de Janeiro, Brazil	Do-Yei Shoji Kabushiki Kaisha Atlas Building (7th Floor) 11, Bingo-machi, 3-chome, Higashi-ku, Osaka, Japan	Associated Agencies (M'cr.) Ltd. Piccadilly House 11 Piccadilly Manchester 1, England	Associated Agencies (M'cr.) Ltd. 27 Kothari Building Napier Road Karachi 2, Pakistan

TEXTILE WORLD . . .

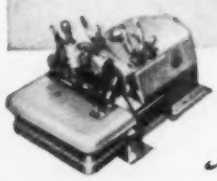
News About Suppliers

ALLIED CHEMICAL CORP., New York, N. Y.—has acquired Snia Viscosa's new process for the manufacture of caprolactam. The company has acquired exclusive rights for the process in the United States and Canada. . . . **LOUIS ALLIS CO.,** Milwaukee, Wis.—Has purchased the Dynapar Corp., Skokie, Ill., marking its entry into the field of electronic equipment. . . . **AMERICAN CYANAMID Co.,** New York, N. Y.—Has announced that the Petrochemicals Dept. has relocated in Bound Brook, N. J. . . . **AMERICAN ENKA CORP.,** New York, N. Y.—Has closed its Chattanooga, Tenn., district sales office with a view to centralizing its marketing personnel and activities at Enka, S. C. . . . **AMERICAN VISCOSE CORP.,** Philadelphia, Pa.—Has appointed Charles R. Shaffer Chicago district sales manager for Avisco cellophane.

ROBERT F. ROMASCO (left) has been appointed service-control manager of Whitin Machine Works, Whitinsville, Mass. JOHN E. HARGREAVES (center) has been appointed president of Scott Testers, Inc., Spartanburg, S.C. ALFRED G. DE MEURISSE (right) has been named sales manager of the chemical division of General Mills, Inc., Kankakee, Ill.

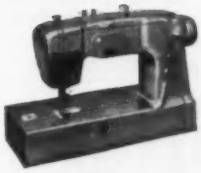
ARMSTRONG CORK CO., Lancaster, Pa.—Has assigned three men to the company's district offices. Walton S. Coverdale has been assigned to Chicago, W. L. Cranmer to New York, and Kenneth P. Irvin to Detroit. . . . **H. W. BUTTERWORTH & SONS CO.,** Bethayres, Pa.—Has announced a lease-purchase plan for its new textile machinery. Under the arrangement a manufacturer can pay the total cost over a period of three to five years. Upon expiration of the lease, the company can obtain a purchase option or renew the lease. . . . **CHEMSTRAND CORP.,** Decatur, Ala.—Has announced two promotions in the company. Norman C. Sidebotham has been named manager of overseas manufacturing and technical liaison for the Overseas Div. W. A. Norman has been named manager of Acrilan technical sales service. . . . **CLINTON CORN PROCESSING CO.,** Clinton, Iowa—Has appointed George H. Burns, formerly Philadelphia district manager, sales manager for the Middle Atlantic states.

COLUMBIA-SOUTHERN CHEMICAL CORP., Pittsburgh, Pa.—Has announced that George L. Payet has joined the firm as supervisor of textile research at its Berberton, Ohio, research laboratory. . . . **DIAMOND ALKALI CO.,** Cleveland, Ohio—Has appointed Stanley B. Honour sales manager of the International Div. in connection with the program to increase emphasis in foreign-marketing activities. . . . **DIXON CORP.,** Bristol, R. I.—Has completed plans to sell, service, and engineer its drafting change-over products through direct factory-trained engineers with headquarters in Charlotte, N. C. . . . **E. I. DU PONT DE NEMOURS & CO.,** Wilmington, Del.—Has appointed Richard E. Nickerson manager of the textile dyes section of the Dyes & Chemicals Div. William G. Rogers has been appointed salesman in the Southern district for the Dyes & Chemicals Div. of the Organic Chemicals Dept. . . . **W. F. FANCOURT CO.,** Philadelphia, Pa.—Has made plans to build a three-story plant in Greensboro, N. C., on a 10-acre tract. . . . **GENERAL ANILINE & FILM CORP.,** New



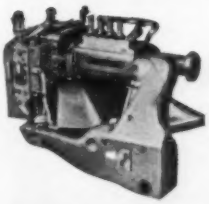
Mauser-Special

Industrial Sewing Machines



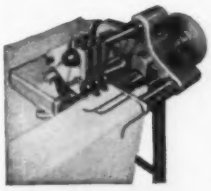
owe their international reputation to the precision of all their component parts, as well as to their most accurate assemblage and extremely precise adjustment.

A complete line of various types are manufactured. They are used for all appropriate purposes by manufacturers of hosiery and knit goods as well as clothing, woven goods, blankets and similar materials.



Our manufacturing program includes:

Overlock Machines
Single Chainstitch Machines
Double Chainstitch Machines
Machines for Sewing Elastics
Border-Attaching Machines
Band-Attaching Machines
Bag Sewing Machines
Cylinder Machines
Feed-off-the-arm Seam-Felling Machines
Flat-Seam Machines
Ribbon Cutting Machines



Leaflets are available on application

INDUSTRIE-WERKE KARLSRUHE
Aktiengesellschaft · Karlsruhe

Exclusive Distributors
NATIONAL INDUSTRIAL MACHINERY CORPORATION
SUITE 5119—EMPIRE STATE BUILDING • 350 FIFTH AVENUE, NEW YORK 1, N. Y.
Phone: Chickering 4-7335—6—7 • Cable Address: Unshoscorp

LYONS SPEED INDICATOR

Measures RPM and linear speeds of both threads and pieces of cloth. Available in 3 ranges with a variety of accessories. Accuracy = 0.25%.

BOULIN
INSTRUMENT CORPORATION
9 FIRST STREET • NORTH PELHAM, N. Y.

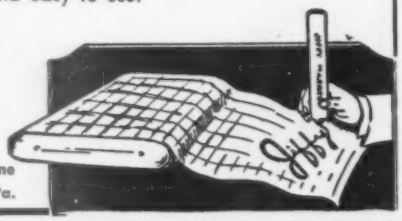
CIRCLE 254 ON READER SERVICE CARD

JIFFY TEXTILE MARKER

For use on rayon, cotton and woolen material. Dye resistant and boil-proof, permanent, inexpensive, quick and easy to use.

For information address

JIFFY TEXTILE MARKER CO.
406 W. School Lane
Philadelphia 44, Pa.



CIRCLE 255 ON READER SERVICE CARD

INDUSTRIAL ENGINEERS

- MODERNIZATION PROGRAMS
- PLANT LAYOUTS
- COST SYSTEMS
- COST REDUCTION REPORTS
- WORK LOAD STUDIES
- MANAGEMENT PROBLEMS
- SPECIAL REPORTS

GREENVILLE, S. C.
Dial CEdar 2-3868
FALL RIVER, MASS.
Dial OSborne 6-8261

SPECIALIZING IN TEXTILES SINCE 1914

Ralph E. Loper Co.

News About Suppliers . . . *Begins on page* 145

York, N. Y.—Has announced eight appointments in the chemical, dyestuff, and pigment divisions of the company. They are: G. G. Bierwirth, Director, Personnel Relations; J. R. Bonnar, Director, Industry and Government Relations; S. S. Colman, Director, Purchasing; P. F. Hand, Manager of Administration; A. Jaffy, Controller; Dr. C. E. Stevens, Director, Marketing Administration; Dr. M. R. Stevinson, Director, Research and Commercial Development; and G. R. Wick, Director, Engineering.

C. F. GETSINGER (left) has been placed in charge of dye sales activities in New England and upper New York state of Eastman Chemical Products Inc., New York, N. Y. PARKER C. FINN (center) has been named sales representative for the Eastern sales district of the Silicone Products Dept. of the General Electric Co., Waterford, N. Y. WILLIAM C. FIFE (right) will represent the west coast office in Downey, Calif. of Fife Mfg. Co., Oklahoma City, Okla.

GENERAL DEVELOPMENT CORP., Elkton, Md.—Has announced that its new Duramir chrome-plating processes will be marketed by Diamond Alkali Co., Cleveland, Ohio. . . . **GOODYEAR TIRE & RUBBER CO.,** Akron, Ohio—Has announced a 1¼-million-dollar expansion of its Akron facilities for production of Chemigum (nitrile) rubber and synthetic latices. . . . **HARTFORD FIBRES CO., DIV. OF BIGELOW-SANFORD, INC.,** Rocky Hill, Conn.—Has named Walter H. Schrader manager of product development for Zantrel. . . . **HERCULES POWDER CO.,** Wilmington, Del.—Has announced the formation of a Fiber Development Dept. and the appointment of Forest B. Evans as manager of the newly created unit. Polymer Industries has been appointed sales agent for CMC warp size for the man-made-fiber and wool, and man-made-fiber and wool blends segments of the textile industry. Charles A. Grant has been named director of sales of the company's Virginia Cellulose Dept. and Paul L. Johnstone has been named assistant general manager of the Cellulose Products Dept.

HEYDEN NEWPORT CHEMICAL CORP., New York, N. Y.—Has appointed Michael J. Gluck vice president and general manager of the International Div. . . . **HOOKER CHEMICAL CORP.,** Niagara Falls, N. Y.—Has elected two vice presidents. Dr. Chris A. Stiegman, formerly director of research, has been named vice president of research and development, and Charles C. Hornbostel, formerly director of finance, is vice president in charge of finance. . . . **HUNGERFORD & TERRY, INC.,** Clayton, N. J.—Has appointed R. G. Weston New England sales manager. . . . **KOPPERS CO., INC.,** Pittsburgh, Pa.—Has named William L. Lyons California sales representative for the Chemical & Dyestuffs Div., with headquarters in Los Angeles. . . . **LANDERS CORP.,** Toledo, Ohio—Has signed a contract providing for the transfer of the business and assets of the corporation to the Interchemical Corp., New York, N. Y. . . . **LUNKENHEIMER CO.,** Cincinnati, Ohio—Has appointed George E. Clark, Jr., to the sales staff with territory in West Virginia, southern Ohio, and eastern Kentucky. James R. Stevens will cover the Houston area and central and south Texas. Melvin M. Tappen will cover the Dallas-Ft. Worth area and west Texas.

MINNEAPOLIS HONEYWELL REGULATOR CO., INTERNATIONAL DIV., Minneapolis, Minn.—Has appointed Charles W. Bowden, Jr., to industrial sales manager of the division. Arthur O. Dietrich has been named to succeed him as advertising and sales promotion manager of Philadelphia-based divisions. . . . **MIXING EQUIPMENT CO.,** Rochester, N. Y.—Has announced the formation of a new company in

Poynton, Chesire, England. The company, formed in conjunction with Stockdale Engineering Co. in England, will be known as Lightnin Mixers Ltd., and will manufacture and distribute the complete line of Lightnin industrial mixers in the European market. . . . **NOPCO CHEMICAL CO.,** Newark, N. J.—Has broken ground for the construction of a completely modern polyether urethane foam plant in Chattanooga, Tenn. . . . **OLIN MATHIESON CHEMICAL CORP.,** New York, N. Y.—Has started operations at its new corrugated-container plant of the Packaging Div. in St. Louis. . . . **OWENS-CORNING FIBERGLAS CORP.,** New York, N. Y.—Has begun initial operations in its new multimillion-dollar textile-yarn manufacturing plant in Aiken, S. C.

PUTNAM CHEMICAL CORP., Beacon, N. Y.—Has appointed J. Raymond Nisbet sales coordinator acting in a liaison capacity between the technical and sales department. . . . **ROBERTS CO.,** Sanford, N. C.—Is completing engineering studies for its new and consolidated plant and offices to be built on a 54-acre site owned by the company in Sanford. Thomas F. McHugh has joined the company as sales engineer for the Northeast and Canadian sales region. . . . **SCOTT PAPER CO.,** Chester, Pa.—Has named Stephen B. Olmsted manager of the company's newly created New York office in the Empire State Building. . . . **SINGER SEWING MACHINE CO.,** New York, N.Y.—Has announced five new appointments in the Industrial Sales Dept. C. H. Griffen has been named manager of marketing services. G. C. Dickson has assumed duties as sales supervisor in the New York office. A. W. Damais has been named manager of the newly combined Product Application and Technical Service Depts. A. L. Menges will assume full responsibility for the purchase of materials for the Industrial Sales Dept. R. M. Kernan, formerly executive assistant, is now responsible for sales training.

SONOCO PRODUCTS CO., Hartsville, S. C.—Has dedicated its new research laboratories building in memory of Dr. James Edward Mills, Sonoco's first chief chemist and research director. . . . **STANLEY WORKS,** New Britain, Conn.—Has appointed Frederic C. Faulkner sales representative in northern New Jersey. John D. O'Hearn has been appointed sales representative in Connecticut for the Stanley Steel Strapping Div. . . . **STOWE-WOODWARD, INC.,** Newton Upper Falls, Mass.—Has opened a new 32,300-sq.-ft. manufacturing plant in Neenah, Wis. . . . **JAMES TALCOTT, INC., TALCOTT LEASING CORP.,** New York, N. Y.—Has named John P. Snyder sales manager of the leasing corporation. . . . **TURBO MACHINE CO.,** Lansdale, Pa.—Has appointed William N. Schwarze sales engineer. . . . **UNION CARBIDE CORP.,** New York, N. Y.—Has named Robert D. Olt assistant to the sales manager of the Crystal Products Dept. of Linde Co. . . . **UNITED STATES RUBBER CO.,** New York, N. Y.—Has elected Earle S. Ebers vice president in charge of the polymer, fiber, and chemical operations of the company. . . . **WARNER & SWASEY CO.,** Cleveland, Ohio—Has formed a new dealer organization to handle sales and service of the company's textile machinery throughout South America. . . . **T. B. WOOD'S SONS CO.,** Chambersburg, Pa.—Has named Arthur L. Giles, Jr., field sales engineer in the Philadelphia territory.

FRED J. EBELING (left) has been named director of sales for Dodge Mfg. Corp., Mishawaka, Ind. KEITH T. MIDDLETON (center) has been elected vice president of Fafnir Bearing Co., New Britain, Conn. GEORGE D. MAYNARD (right) has been appointed manager of export sales for Merrow Machine Co., Hartford, Conn.

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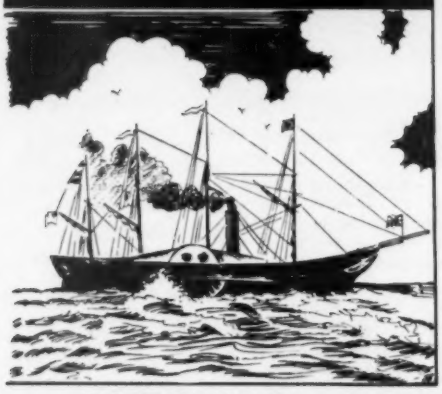
The *first* Regular Steam Vessel to cross the Atlantic from the United States direct was the steam packet, CITY OF KINGSTON – sailed from Baltimore in 1838.



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Consult your local dyestuff distributors for information and samples. Shipments can be made from our Baltimore factory.

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Cut cloth 2 to 4 times faster

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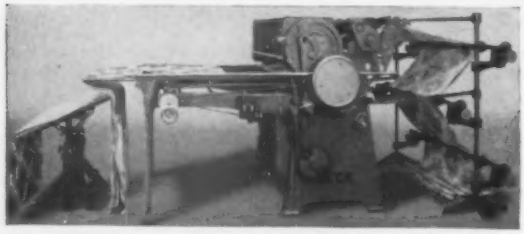
BECK ROLL SHEET CUTTER



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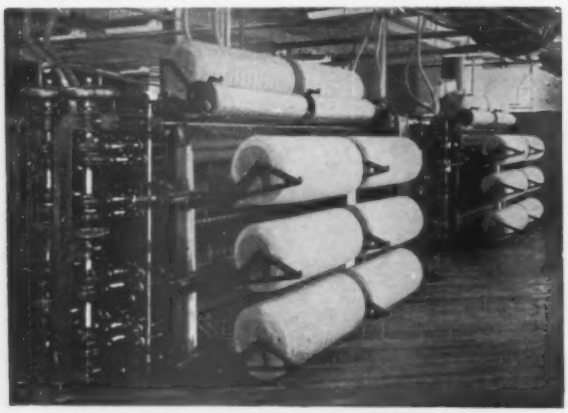
CIRCLE 256 ON READER SERVICE CARD



DOUBLE RUB, FOUR BANK TAPE CONDENSER

Built in 48", 60", 72" widths for adaptation to all carding machines. Write for information.

Duesberg-Bosson of America, Inc.
Main Street Jefferson, Mass. P.O. Box 25

TEXTILE WORLD. . . News About Men

DAVID E. LEWIS has been appointed a vice president of Wellington Sears Co., New York, N. Y.

H. G. Barnard, general sales manager of the Textile Div., The Kendall Co., Boston, Mass., has been elected a director of the Textile Fabrics Association.

M. A. Bearden has retired as general manager of the Cliffside Div., Cone Mills, Inc., Greensboro, N. C.

Madison F. Bond has been named plant manager of Brookneal Finishing Plant, Brookneal, Va.

Robert Booth has been appointed director of manufacturing for The Kendall Co., Boston, Mass.

Charles T. Cooper has been appointed assistant superintendent of Tallapoosa Mill, American Thread Co., Inc., Tallapoosa, Ga.

Hugh Dales, president of Wigwam Mills, Sheboygan, Wis., has been elected president of the Wool Hosiery Institute of America.

R. F. Daugherty has been named superintendent of Ranlo Mfg. Co., Gastonia, N. C.

Richard E. Donner has been elected president of Dyersburg Cotton Products, Inc., Dyersburg, Tenn.

George N. Door, Jr., president of Door Woolen Co., Guild, N. H., has been elected chairman of the Wool Manufacturers Council of the Northern Textile Association.

E. M. Diaz has been named technical assistant in the operations division of American Thread Co., New York, N. Y. **Rex Fairchild** has been appointed assistant superintendent of finishing with headquarters in New York.

John F. Field, executive vice president of Cone Mills, Inc., New York, N. Y., has been elected a director of the Textile Fabrics Association.

J. M. Grantham has been promoted to superintendent of Flint Mill, Ranlo Mfg. Co., Gastonia, N. C.

Herbert B. Greenbaum has joined the staff of Talbot Mills, Inc., New York, N. Y.

Lamar Greene has been named assistant overseer of weaving at Judson Mills, Greenville, S. C.

Victor S. Goldberg has been appointed sales manager and vice president of the Bangor Div., Collins & Aikman Corp., New York, N. Y.

D. R. Gregory has been named central production manager of Abbeville Mills Corp., Abbeville, S. C.

William E. Hale has been appointed vice president in charge of sales of Coronet Carpets, Inc., Dalton, Ga.

F. N. Howard has been named assistant technical superintendent, weaving division, Judson Mills, Greenville, S. C.

Fred L. Johnson, president of Belding Heminway Co., New York, N. Y., has been re-elected chairman of the Thread Institute.

Rogers L. Johnson has been appointed assistant research director for American Thread Co., Inc., New York.

H. R. Jones has been appointed superintendent of No. 2 Mill, Winnsboro Mills, United States Rubber Co., Winnsboro, S. C.

B. R. Langley, Jr., has been named assistant overseer of spinning at Judson Mills, Greenville, S. C.

Julius Lasnick has been named product manager and coordinator for both Abbeville and Laurens Mills, Abbeville Mills Corp., Abbeville and Laurens, N. C.

James D. Lawrence has been named vice president of Clearbrook Woolen Co., Clearbrook, Va.

Henry J. Linton has been named director of fabric development for Iselin-Jefferson Co., Inc., New York, N. Y.

Arthur Makin has retired as manager of Tabardrey Plant, Cone Mills, Inc., New York, N. Y.

J. Alden Miller has retired from Louisville Textiles, Louisville, Ky.

Albert V. Morrell has been named manager of the Fabric Div., Helliwig Dyeing Corp., Philadelphia, Pa.

Elliott Morrill, plant manager of the Indianapolis plant of Corn Products Co., New York, N. Y., has been elected president of the AATCC for 1961.

Henry D. Ott, Jr., has been named chief industrial engineer of Gayley Mills, Marietta, S. C.

Jean W. Schenck, president of Lily Mills Co., Shelby, N. C., has been elected to the board of directors of Belding Heminway Co., Inc., New York, N. Y.

R. B. Simmons has been promoted to general overseer of spinning department 27 at Judson Mills, Greenville, S. C.

H. Stanton Smith, president

LOUIS CHENAULT has been named manager of the Houston plant and sales division of Bemis Bag Co., St. Louis, Mo.

ERNEST J. CHORNYEI has been elected president and chief executive officer of Bradford Dyeing Association, Westerly, R. I.

JOHN B. CLARK has been elected a director of Bigelow-Sanford, Inc., New York, N. Y. He is president of Coats & Clark, Inc.

GLENN F. ROQUEMORE has been appointed projects manager of the Physical Research Dept. of Bemis Bag Co., St. Louis, Mo.

Now—EASTERN'S Flying Freighters offer

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New York—Miami—San Juan
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- Reserved space on every Freighter flight.
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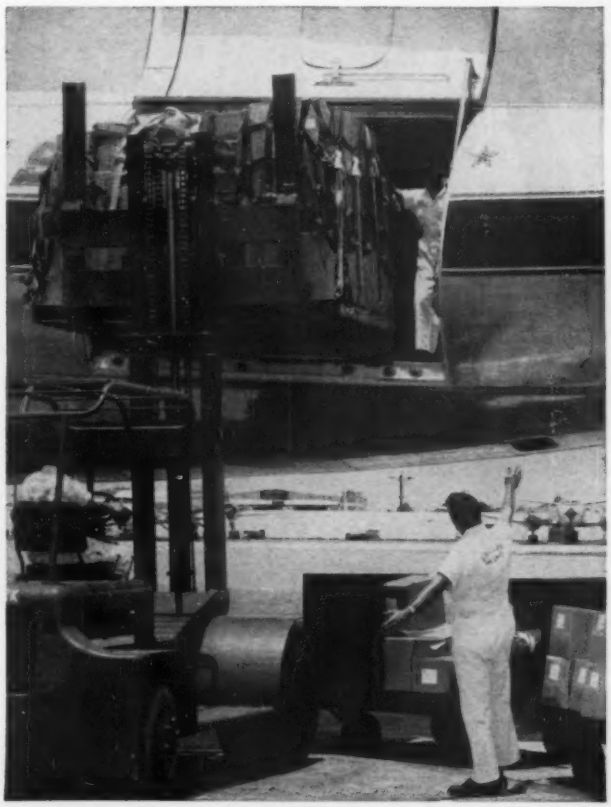
EASTERN AIR LINES



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Northern Hard MAPLE
the finest floor that grows
Most modern touch you can give to a building! These bright, smooth, enduring floors of delicately-grained MFMA Northern Hard Maple bring any space up-to-date like magic. A grade for every budget—all good grades! Use MFMA Maple or Birch. They're guaranteed. Write—
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CIRCLE 258 ON READER SERVICE CARD

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It will help us to keep your copies of TEXTILE WORLD coming to you each month if you will promptly advise us of any change of address.

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Please change the address of my Textile World subscription.

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Old Address .....
New Address .....
New Company Connection .....
New Title or Position .....

News About Men . . . *Begins on page* 148

of Moore Fabrics, Inc., Pawtucket, R. I., has been elected president of the Elastic Fabric Manufacturers Institute, Inc.

Earle R. Stall, Sr., has retired as a member of the board of directors and a vice president of Cone Mills Corp., Greensboro, N. C. He had been in charge of operations at the American Spinning Plant at Greenville, S. C.; and Florence Plant at Forest City, Cliffside Plant at Cliffside, and Haynes Plant at Avondale, N. C.

William H. Stallworth has been named to assist in the formation of a new blending unit in Spartanburg, S. C., for Milliken Woolens, Inc., New York, N. Y.

Charles B. Straus, executive vice president of United Merchants & Manufacturers, Inc., New York, N. Y., has retired from active business.

Clarence Taggart has been appointed executive vice president of Riegel Textile Sales Co., New York, N. Y.

Clyde Thomas has been named general superintendent of trucking for the American Thread Co., Inc., New York.

Dr. George van der Wath, chairman of the South African Wool Board, has been appointed chairman of the Wool Bureau, Inc., New York, N. Y.

Durwell Vetter has joined the wool-buying staff of National Worsted Mills, Jamestown, N. Y.

Z. W. Walker, III, has been appointed sales representative assigned to the Greenville office of Cone Mills, Inc., New York, N. Y.

Colon W. York has been named general manager of Peerless Textiles, Cleveland, Tenn.

C. J. Young has been appointed training supervisor at Judson Mills, Greenville, S. C.

George E. Ziegler has been named assistant to the director of manufacturing for the textile division with offices in Charlotte, N. C., for The Kendall Co., Boston, Mass.

OBITUARIES

James Bains, Jr., 67, vice president and director, Coats & Clark, Inc., New York, N. Y.

Theodore M. Baxter, 64, assistant manager and buyer, Baxter, Kelly & Faust, Inc., Philadelphia, Pa.

Samuel D. Boden, 78, former secretary and treasurer of Louisville Textiles Inc., Louisville, Ky.

Lawrence F. Dulligan, 70, former plant superintendent, Lowell Bleachery South, Griffin, Ga.

Gregory Ferenbach, 59, chairman of the board, Leon Ferenbach, Inc., New York.

Fernando Casablancas, 86, original inventor of high drafting in textile spinning, Salford, Eng.

H. Frank Hunsucker, 80, chairman of the board, Highland Cotton Mills, Inc., High Point, N. C.

Charles W. Kleppinger, 52, owner, Delmarva Narrow Fabrics, Inc., Easton, Md.

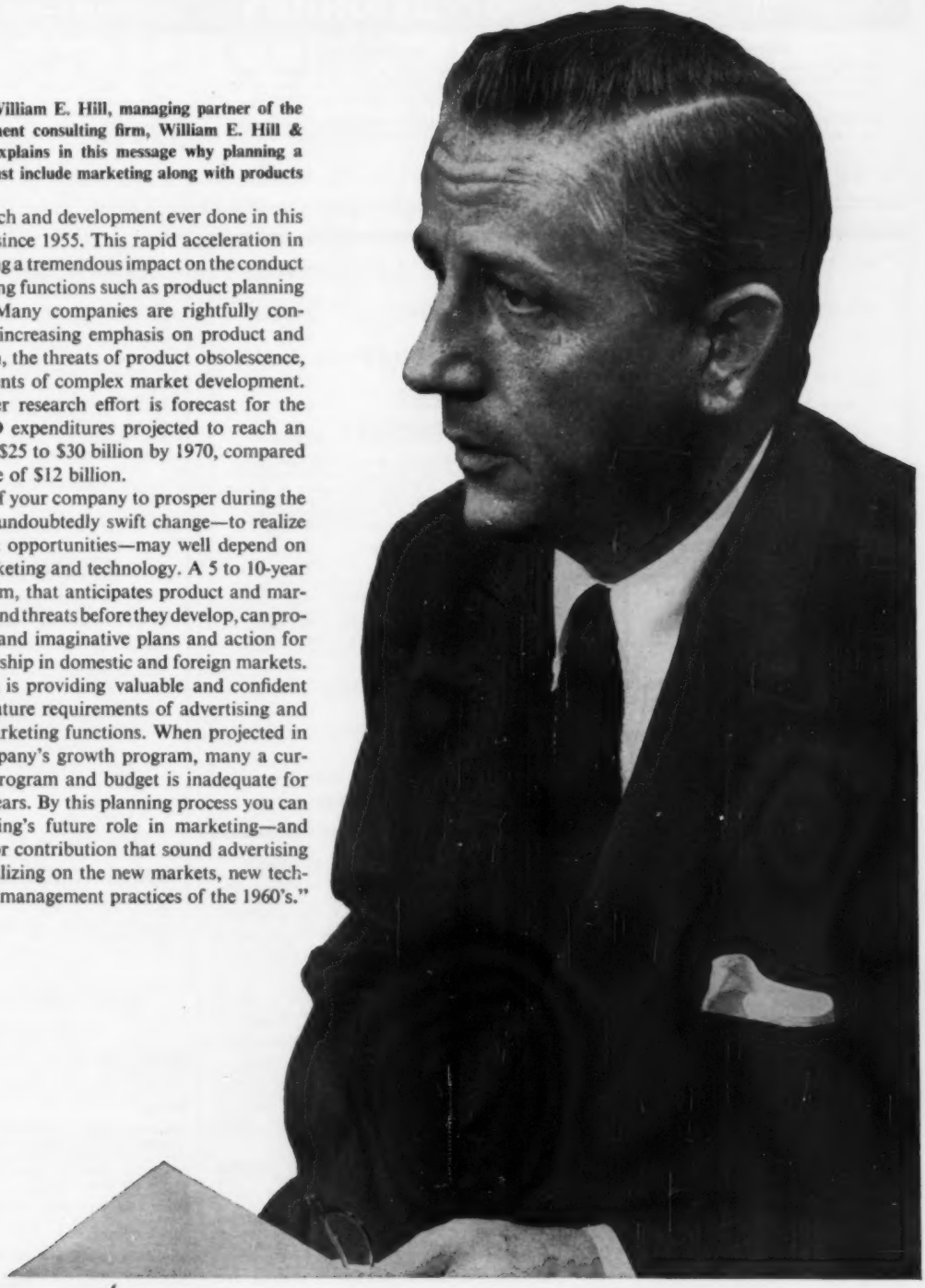
Walter Larkin, 88, inventor of the first electronically controlled seamless-hosiery machine and senior inventor for Singer-Fidelity, Inc., Philadelphia, Pa.

Rufus S. Laws, 54, founder and president, A. & L. Hosiery Mills, Inc., High Point, N. C.

William H. Stoneaker, 72, retired chairman of the board, Mill Factors Corp., East Orange, N. J.

Max B. Zahler, 68, president, Blue Mountain Textile Co., Wind Gap, Pa.

"Long-range planning for advertising?"



"Certainly," says William E. Hill, managing partner of the New York management consulting firm, William E. Hill & Company, and he explains in this message why planning a company's future must include marketing along with products and processes.

"Half the research and development ever done in this country has been since 1955. This rapid acceleration in technology is having a tremendous impact on the conduct of specific marketing functions such as product planning and advertising. Many companies are rightfully concerned about the increasing emphasis on product and process innovation, the threats of product obsolescence, and the requirements of complex market development. And still a greater research effort is forecast for the 1960's, with R&D expenditures projected to reach an estimated level of $25 to $30 billion by 1970, compared with a present rate of $12 billion.

"The capacity of your company to prosper during the next ten years of undoubtedly swift change—to realize the period's profit opportunities—may well depend on your creative marketing and technology. A 5 to 10-year long-range program, that anticipates product and market opportunities and threats before they develop, can provide the advance and imaginative plans and action for competitive leadership in domestic and foreign markets.

"Such planning is providing valuable and confident insight into the future requirements of advertising and its companion marketing functions. When projected in relation to a company's growth program, many a current advertising program and budget is inadequate for the next 5 to 10 years. By this planning process you can optimize advertising's future role in marketing—and establish the major contribution that sound advertising can play in capitalizing on the new markets, new technologies and new management practices of the 1960's."

AIA

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Consider These and Other Current Openings with

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TEXTILE FIBERS LUBRICANT CHEMIST . . .

Assist in customer problems; evaluation of new fiber treatment; development of special products to meet customer requirements. 0-5 years experience in fiber lubricants or synthetic fiber manufacturing. Position leads to technical service work with customers. B.S. textile chemistry or textile Engineering preferred.

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DUTIES:—textile lab operations including development & evaluation of scouring agents, warp sizes, fulling compounds, fiber lubricants, dyeing assistance, water repellents, etc. 2-5 years diverse textile operations or textile chem. manufacturing experience required. B. S. textile Chemistry or Technology preferred.

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Send resumes to:—PROFESSIONAL RELATIONS

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MAINTENANCE ENGINEER

Opportunity for man with proven experience in maintenance supervision. Position with expanding, long-established textile firm in Raleigh, N. C., area.

Complete supervision of high pressure boilers, electrical equipment, machine shop and plant maintenance.

Excellent company benefits. Relocation expenses. Starting salary $7500-$11,000, dependent upon experience and ability.

Reply, stating work history, age, reference, qualifications and education, to

P-5749, Textile World
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

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We can solve all your new and used Textile Machinery problems. Our staff of Experts are thoroughly experienced Practical Textile Men. We can save you plenty of money, and the continued good will of your Clients by advising you, and locating for you the proper equipment you require from one machine up to a complete mill. We do not buy and sell. We are not machinery Dealers. Our services are strictly for you and your Clients best interests. We would be pleased to send you the details, and what they mean to you.

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New & Used Textile Machinery, Etc.
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Over 55 years in business, serving employers seeking new executives and executives seeking positions. We invite your inquiries.

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WANTED—TENTER FRAME & HOUSING

Clip tenter with oven housing complete
Width—68" minimum
Length of oven—20' minimum.
Preferably gas fired.
Must be in good condition.

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CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Wanted superintendent moderate size cotton manufacturing plant carding, spinning and weaving. Address reply to Supt. care Textile Industries, P-5771, Textile World.

Director of Manufacturing, Styling And Designing. Technical Manager of Integrated Mills or Converting Operations. Bruenn graduate. Age 48. 25 years of creative managerial and styling experience in the U.S.A., and overseas. Creator of new fabrics and blends in woven piece goods. Worsteds, woolens and blends with synthetics, hair and furs for men's and women's wear. Planning, direction and supervision of all manufacturing phases, through spinning, weaving and finishing. Efficiency and cost controls. Raw material and machinery buyer. Development of new industrial projects. Speaks several languages. Seeks adequate, leading positon in the U.S.A., or abroad. P-5802, Textile World.

SELLING OPPORTUNITIES AVAILABLE

Machinery territories open—liberal commissions—unique equipment for knitters, weavers, finishers. RW-5823, Textile World.

Wanted: Textile printing technical service representative, operating from New York metropolitan headquarters. Thorough knowledge of dyestuffs and their application to textile printing necessary. Company is already well established in this field. Please send detailed resume including salary requirements to RW-5848, Textile World.

POSITIONS WANTED

Textile Superintendent—Thoroughly experienced in preparatory and weaving all fabrics, natural and man made fibers. Know all types C&K and Draper looms. Available for domestic or overseas position. PW-5691, Textile World.

Wanted: Position as overseer of weaving. Twenty years experience on box looms, draper looms, fancy and plain. All kinds of yarns, woolen worsted, cotton's, all kinds of synthetic's yarns'. If you want cost minded, with practical ideas, followup and aggressive overseer, write, otherwise do not waste your time and mine. PW-5610, Textile World.

Wanted: Position as manager of weaving mill. Twenty-one years' experience on C & K, shaft, and jacquard looms. All kinds of yarns including synthetics. If you want a conscientious, cost minded man with practical ideas capable of setting up and/or running an entire plant, reply; otherwise do not waste my time and yours. PW-5846, Textile World.

Raschel lace mechanic with extensive experience desires responsible position, capable of taking complete charge of operation, analysis, layout. Relocate. PW-5836, Textile World.

POSITIONS WANTED

Knitter Mechanic—Tricot Machines—pattern making—20 years experience in Europe, Australia and U. S.—Good reference—Desires challenging position. PW-5827, Textile World.

Weaving Supt., presently employed, seeking change. Fancy woolen, worsted, blends experience with essential background in human relations, quality, production, cost. PW-5796, Textile World.

Supt: Dyeing and Finishing. Experience: Sweaters, Piece Goods, Hosiery, all Fibers, Fabrics and Blends. PW-5776, Textile World.

Graduate chemist with heavy experience in dyeing and printing all fabrics, desires to change position. PW-5770, Textile World.

Textile Engineer—age 33, dyeing and finishing plant experience, now selling imported machinery, desires new sales challenge. PW-5741, Textile World.

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Established Manufacturers Representative selling Automotive Industry seeks additional textile product for automobile body interiors. RA-4452, Textile World.

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TEXSTYLE CORP., CLIFTON, N. J.

A Complete Modern Printing, Dyeing and Finishing Plant

PRINTING

4—Rice, Barton & Fales and Textile Machinery 8 color Print Machines 50", with dryers, washers, motors and auxiliary equipment
1—Rice, Barton & Fales 8 color Print Machine 60", with dryer, washer, motor and auxiliary equipment
3000—Engraved Copper Print Rollers
4—Vat Agers, stainless steel and brass rolls
1—Stainless Steel Acid Ager, 15' long, 66" rolls
1—Rice, Barton & Fales Mandrel Jack

DYEING

1—Burlington Stainless Steel Beam Dyeing Unit, 2 stainless steel beams, motor and pump
8—Textile & Werner Stainless Steel Dye Jiggs 50" & 70", motors and drives
13—Stainless Steel enclosed Dye Boxes, 6' to 18', motors and drives
4—Troy Stainless Steel Tumbler Washers, motors and drives

FINISHING

1—V.V. Tenter Finishing Range consisting of Morrison 2 roll micro-set padder, 6 stainless cans, heavy duty frame 90' x 60", National housing, motor generator set
1—V.V. Palmer Tenter Unit frame 60' x 66", padder 60", palmer, batcher, DC generator
1—V.V. 3 roll Calendar 60", motor and drive
1—Verduin Hydraulic Calendar 58", 3 rolls, 40 ton pressure, motor and drive
1—Werner Schreiner 2 roll Calendar 50", 50 ton pressure, U. S. vari-drive, age 1956
2—V.V. Heavy Duty Tenter Frame 60' x 66"
1—National Loop Dryer 60', 92" sticks, 10 fans, motor and drive
1—Verduin 3 roll Padder 50", motor and drive
1—Marlow Stainless Steel 3 compartment Washer, 62 x 35" deep, motor and drive
1—Morrison Button Breaker 60", 19 plastic rolls, motor and drive

OTHER MODERN TEXTILE MACHINERY AVAILABLE

BORDER CITY DIV. OF SAGAMORE MFG. CO—CANADIAN COTTONS LTD.

SPINNING

111—Whitin F Spinning Frames, 3" Casablanca long draft
36—Whitin F2 Spinning Frames, 3½" ga. super draft
24—Whitin J Combers
160—Platt 40" Cards
10—New Whitin model N Spinning Frames

THROWING & PREPARATORY

12—Atwood Redraw Machines, 1950, 68 spindles
56—Universal #10 Uptwisters, 184 spdls. 2 lbs. headless package, 1950
3—Sipp-Eastwood Warpers, '49
1—Johnson 7 can Slasher, 1949
1—Uxbridge Gentle Air Slasher
3—Abbott Quillers, 120 spdls. 1955, Pin Boards
208—Spindles Whitin Schweiter Quillers, Motor Drive
3—Barber-Colman Spoolers, 252, 162 pockets
2—Abbott model 64 Cone Winders, 100 spdls. each

WEAVING

200—Draper XD Looms, 54" reed, Diehl and motor, 1947-1951
300—X Looms 40" & 60" cloth

14—Draper D Looms 66" cam type, Motor Drive
33—C & K C2 Looms 40"
800—Draper K Looms, cam, 47" Reed, Motors
3—Barber-Colman Portable Tying-In Machines, 1949
24—Draper X2 Looms 40"

DYEING AND FINISHING

1—Cocker Indigo Dye Range, '48
1—Rodney Hunt Stainless Open Width Washer, 80", 2 comp.
4—Venango S.S. Package Dye Unit, 1948, 3—500 lbs.
4—Blickman Totally Enclosed S.S. Dye Boxes, 2-12', 2-8'
44—S.S. Dry Cans 142x23" dia.
4—S.S. Dry Cans, 66"—50 lb.
61—Norton S.S. Dry Cans 48"x 23" dia. Motor & Drive
28—Montford Double Acting Nappers, Motor & Drive
1—Parks & Woolson Hi-Speed Davidson Shear 66½", 1947
1—P & S Cure Dryer, 25', gas fired, 1954
1—Rice, Barton & Fales 8 color Print Machine 52"
200—Copper Print Rollers

Republic
TEXTILE EQUIPMENT COMPANY

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PURCHASE AND SALE TEXTILE MACHINERY
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LIQUIDATION OF MILL PROPERTIES

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MODERN TEXTILE MACHINERY FOR SALE

1—Morrison Continuous Open Width Dye Range 60", Age 1948, 2—Williams Units, 3 Wash Units, Pneu. Padder—15 ton, Vacuum Extractor, M.G. Set
1—Werner Hydraulic Schreiner Calender, 47" face, 50 ton, 20 HP motor, Age 1954
2—Proctor & Schwartz Loop Dryers, 60' long, steam heated, 1—126" sticks, 1—102" sticks, Age 1948
1—Andrews & Goodrich Air Lay Dryer, 54' long, 64" conveyor, elec. eye, Motor Generator Unit
1—Burlington Engineering, stainless, Pressure Dye Unit
3—Rodney Hunt Stainless Encl. Dye Boxes, 16' wide, 47" deep
2—Van Doorne Stainless, Encl. Dye Boxes, 12' wide, 42" deep
2—Rodney Hunt Stainless Encl. Dye Boxes, 10' wide, 47" deep
1—Rodney Hunt Stainless Encl. Dye Box, 2' wide, 42" deep
1—Van Doorne Stainless Encl., 4' Dye Box
1—American Laundry Cloth Press
1—Winsor & Jerauld Tenter Frame, 30' long, 72" wide, motor
1—Rodney Hunt Dye Machine, 40" Pneu. Squeezers, Age 1956
1—Morrison Micro-Set Padder, 60" wide, 2 rolls, 8 ton, D. C. motor
1—Van Vlaanderen 3 roll Calender, 60" wide, lever set
1—Continuous Stainless Rope Bleach Range—Age 1954: Wiesner-Rapp 24" Saturator, Becco 1500 yd. J-Box
2—SmithDrum Stainless Package Dye Machines, 500-lb., 1948 with 9 stainless carriers
1—Obermier Stainless Package Dye Machine—300 lb
2—Proctor & Schwartz 6 Drawer Tray Dryers
12—Stainless Steel Dye House Trucks, 60" long
3—Werner Stainless Encl. 70" Dye Jiggs
1—Rodney Hunt Stainless 80" Open Width Washers, 2 compts.
1—Meadows Hyd. Embossing Calender, 72" wide, 2 rolls, 25-ton—Age 1949
1—Van Vlaanderen Hyd. Calender, 60" wide, 40-ton, Age 1950
12—C & K W3 Convert. Looms, 64" wide, motor
24—C & K W3 Convert. Looms, 82" wide, motor
70—C & K S6 Looms, 2x1 box, 58" wide, Age 1951
26—C & K S6 Looms, 4x1 box, 54" wide, Age 1948
148 spdls.—Whitin Schweiter Hi Speed Quiller, Model MS, Age 1950
1—Abbott Paper Cone Winder, Model #65, 100 spdls., 8° 4' cone, Age 1948
1—Barber-Colman Portable Tying-In Machine, Model LC—Age 1951
1—Barber-Colman Portable Tying-In Machine, Model LL, motor —Age 1951
1—Cocker Hi-Speed Warper, 54½" wide, 480 end mag. creel, 5 HP motor
4—Power Inspection Tables, 80" wide, 3 HP gear motor
10 sets—Cloth Guiders, air and spring type

46—Warner-Swasey "Sulzer" Automatic Shuttleless Looms, 80" wide, 30 Looms—Standard 8 harness, 16 Looms—Staubli Heads, 25 harness—Age 1950-3

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FOR SALE
SELECT TEXTILE EQUIPMENT

1—BRUSHING Machine, McCreary, 60", for Sweaters and Blankets, M.D.
1—BUTTON BREAKER, Morrison, 60", 19 heavy duty brass rolls, M.D.
1—CLOTH CONDITIONING Mach., J. Hunter, 1957, 96", 48 Passes, Auto. Cont.
1—DESPECKING Machine, P&W., 89", Scray, Folder, Exhaust Fan, M.D.
1—SEMI-DECATUR, Gessner, Perf. Cyl. 72"x36" dia., V. Pump, Motor Drive.
2—FLAT FOLDERS, C&M., E&H., 42", 47½", ½ yard and 1 yd. folds, M.D.
1—HOPPER FEED, Raw Stock, Harwood, 54", with Bottom Apron.
2—INSPECTING Machines, Hermas, Blake, 45", 58", Tube to Tube.
1—DYE KETTLE, R. Hunt, Trushade, 8 String, Hump Reel, Motor Driven.
4—LOOMS, C&K., 92", Automatic, 4x1, 25 Harness Head, E.W.S.M., Motor Dr.
20—DOBBY LOOMS, C&K., 37½" between swords, Reed Space 33½", 4x1 Box.
1—KNITGOODS NAPPER, D&F., 20 Gear Driven Rolls, 90", Folder, M.D.
1—NAPPER, Gessner, S.A., 80", 20 V-belt Driven Rolls, Reeves Energy Cont.
1—NAPPER, D&F., D.A., 80", 24 Belt Driven Rolls, Folder, Motor Driven.
2—NAPPER GRINDERS, D&F., Roy, 90 to 110", Face and Side Grinding, M.D.
1—SHREDDING PICKER, D&F (Dreadnought), 48", 12 Bar, B.B., Feed Table.
1—MIXING PICKER, D&F., 60", Model 32, 6 Bar, Feed Table, Knotwood Apron.
3—PICKERS, C&M., 24 to 40", 12 Bar B.B. Cylinder, Feed Tables, M.D.
1—PRINTING Mach., R.B. & F., 5 Color, Steel Cyl. 48"x24" dia., Dryer.
1—PALMER-TENTER Unit, V.V., 60", S.S. Dry Cans, Tenter Frame, Palmerette.
2—QUETSCHES, V.V., Hinneken, 50", 2 and 3 roll, Immersion Pans.
1—SLITTING RANGE, Knitgoods, tubular, with Detwister and Folder.
1—HEAT SETTING UNIT, McCreary, 60", Calrod Heating units, Pneumatic lift.
1—SQUEEZE SET, R. Hunt, 2 Roll, 80", Speed Reducer, Motor Drive.
2—SHEARS, C&M., Single Blade, Woolen and Velvet type, 86".
2—RING TWISTERS, Collins, 200 Sp., 3¼" Ring, 7½" traverse, Creel, M.D.
2—TENTER FRAMES, Butterworth, Clip type, 50", Mangle, 25 Dry Cans.
1—TENTER FRAME, Renshaw, pin type, Over/Under, 60"x30', Enclosure, M.D.
1—WAXER, C&M., 4 Brushes; 1 heated, for 60" Cloth, M.D.
1—WINDER, Foster, Mod. 101, 100 Sp., ⅝" Perf. Dye Tubes, 5¾" Trav.

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6 VV 60" Model 720 Dye Jiggs with covers.
1 Verduin 60" 40 ton Hyd. Calender
1 Morrison Heat Setting Unit
3 Tenter Frames with Palmers and Quetch 40'—60' 2 with housings—gas fired
2 Verduin 6' enclosed Dye Becks
1 VV—65" Air Quetch Pad

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CIRCLE 405 ON READER SERVICE CARD

LIQUIDATIONS

In addition to recently concluding liquidations at **BEAVERBROOK MILLS, INC.,** Dracut, Mass.; **KING PHILIP FINISHING DIV.,** Berkshire Hathaway, Inc., Lonsdale, R. I.; **PLANT #4,** Berkshire Hathaway, Inc.; Adams, Mass.;

BERKSHIRE WOOLEN CO., Pittsfield, Mass.
BERKSHIRE WOOLEN CO., Moncks Corner, S. C.
BACHMANN UXBRIDGE WORSTED CO., Uxbridge, Mass.
RIVULET PLANT, Bachmann Uxbridge Worsted Co., No. Uxbridge, Mass.
THOS. KAY WOOLEN CO., Salem, Oregon
A. J. BRUMBACH INC., (St. Lawrence Woolen Mill), Esterly, Pa.

SEYMOUR WOOLEN MILLS, Seymour, Ind.; and **MERRIMACK MFG. CO.,** Lowell, Mass., we are still liquidating the following mills and plants:

ALEXANDER WOOL COMBING CO., Lowell, Mass.
CLINTON WOOLEN MFG. CO., Clinton, Mich.
ST. MARYS WOOLEN MFG. CO., INC., (Surplus Machinery only) St. Marys, Ohio
WILLIAM PARK & SONS, INC., (Riverside Woolen Mill), Stafford, Conn.

Of the above, William Park & Sons, Inc., started Jan. 1, 1961 and is previously unadvertised. It is an 8-set fully integrated woolen mill with 82" looms. The Berkshire Woolen Co. and Uxbridge Worsted Co. plants have been open for liquidation only about 3 months. The other sales have been running longer.

Below are some specially selected items from these liquidations as well as other locations.

60—DRAPER 82" B.S. MDL. XD LOOMS, 2 x 1 boxes, 8¾" bobbins, 550/60/3 M.D.'s
30—yr. 1953, 6 harness cam motion.
10—yr. 1953, 20 harness gem head motion.
20—yr. 1956, 20 harness gem head motion.

1—SARGENT 60" x 5 BOWL WOOL SCOURING TRAIN, with feed, pneumatic squeezes, controls, pumps, and motor drives.
SARGENT 8' x 8 SECTION RAW STOCK DRYER, with feed, blowup section, and motors. 550/60/3. **ALL YEAR 1949.**

WOOLEN SPINNING FRAMES

2—D&F 144 x 6½" x 5" Ring **MDL F,** yr. 1951. (Installed 1954).
4—WHITIN 120 x 6" x 5" Ring **MDL E,** yr. 1938-1949.
1—WHITIN 120 x 6½" x 5" Ring **MDL G,** yr. 1954.
12—D&F 120 x 6½" x 5" Ring, **MDL E,** yr. 1944-7.
5—WHITIN 120 x 6½" x 5" Ring **MDL E,** yr. 1939-41.
9—WHITIN 120 x 6¼" x 4½" Ring **MDL E,** yr. 1940-48.
6—WHITIN 120 x 6¼" x 5" Ring **MDL E,** yr. 1936-38.
8—WHITIN 144 x 6¼" x 4½" Ring **MDL E,** yr. 1940-43.

WARNER & SWASEY WEAVING MACHINES

12—110", filling mix.
2—95".
11—80", Staubli Heads.
2—80".

1—ABBOTT 142 spdl. x 6" Traverse **MDL 65 WOOD CONE WINDER,** Yr. 1954.
1—SARGENT 72" AUTO BOX DUSTER, Yr. 1960.
2—MORTON SS RAW STOCK DYE KETTLES, 100 lb. & 600 lb., both yr. 1950.
1—FRANKLIN 500 lb. **SS RAW STOCK DYE KETTLE.**
6—WARNER & SWASEY DUAL CAN PIN DRAFTERS, Mdl. M-2350.
17—Sets 3 CYL. WOOLEN CARDS, 60x60, D&F and WHITIN, Peraltas, single & double rub Tape Condensers.
4—Sets 3 CYL. 48" x 60" d. WOOLEN CARDS, D&F, Peraltas, single & double rub Tape Condensers.
5—48" CENTER DRAW BROADBAND INTERMEDIATE FEEDS, D&F and **WHITIN,** complete with Tables.
8—DUESBERG BOSSON PERALTAS, 48" & 60", hydraulic loading.
4—JOHNSON & BASSETT 360 spdl. x 2¾" ga. **GIANT PACKAGE MULES,** Yr. 1946-7.

NAPPERS

1—GESSNER 80" x 24 Roll **Hi Torque,** double acting.
1—Set spare **Gessner Hi Torque NAPPER ROLLS,** 24 Rolls—80" long.
2—WOONSOCKET 84" x 24 Roll, double acting, in tandem.
4—D&F 100" x 14 Roll, single acting, yr. 1945.
2—D&F 100" x 24 Roll, double acting, yr. 1946.
2—D&F 90" x 14 Roll, single acting, in tandem.
1—D&F 110" x 24 Roll, double acting.
1—GESSNER 74" x 18 Roll, double acting.
1—WOONSOCKET 90" x 20 Roll, single acting, yr. 1954.
1—WOONSOCKET 96" x 20 Roll, single acting, yr. 1950.

SPECIAL STOCK DYE UNIT

NOTE—This unit originally used on luxury fibres and hairs. All 550/60/3.
2—R&L 200 LB. SS SPECIAL STOCK DYE KETTLES, controls, pumps, motors. Yr. 1956.
1—SMITH DRUM 92" ROTARY 300 LB. SS DYE MACHINE.
1—SARGENT 44" x 2 SECTION SS RAW STOCK DRYER, with ss feed, control, and motors. Yr. 1956.

COTTON MACHINERY

30—WHITIN MDL J COMBERS, 8 delivery, Yr. 1950-1.
4—WHITIN MDL C RIBBON LAPPERS, 6 head, Yr. 1951-4.

1—D&F 60" x 72 END DOUBLE RUB TAPE CONDENSER, Yr. 1950.
106—C&K 82" W-3 LOOMS, woolen & worsted, convertible & nonconvertible.
1—HUNTER 69" RUBBER ROLL CLOTH WASHER, Yr. 1951, pneumatic pressure.
1—TOLHURST "SUPREX" 48" CENTRIFUGAL EXTRACTOR, ss basket.
1—FLETCHER "WHIRLWIND" 60" CENTRIFUGAL EXTRACTOR, ss basket.
1—MOUNT HOPE 65" BOWED WEFT STRAIGHTENER, coupled together with 65" **"MDL SP" SKEWED WEFT STRAIGHTENER. ALL YR. 1958.**
1—MOUNT HOPE TENTER RAIL SHIFTING SYSTEM, with valves and cylinders. **YR. 1958.**
1—PARKS & WOOLSON 80½" SGL BLADE DAVIDSON SHEAR, YR. 1957.
2—GESSNER MDL PD ROTARY HI SPEED CLOTH PRESSES, 72" & 84", 20" dia. cyl.
1—P&W 72" x 60" dia. SEMI DECATER.
3—R&L SS TOTALLY ENCLOSED PIECE DYE KETTLES, each with Foxboro Cyclelog Control. 1 each 8', 9' & 10'.

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PARTIAL LIST

1—72" 15 ton Hydraulic Padder, 2 rubber rolls.
3—70" Weft Straighteners, mechanical and electronic.
22—50", 60", 70" Dye Jiggs, enclosed and open.
20—8' to 20' Dye Becks, enclosed and open.
1—72" x 100' Enclosed Tenter Range, with Padder and M. G. Set.
1—72" Tensitrol Washer, 4 compartment, with M. G. Set.
1—60" Benninger Pressure Jigg.
1—72" Proctor & Schwartz Loop Curer, 300 yard capacity.
1—10 Fan Loop Dryer, 104" revolving poles.
4—Tenter Frames, 20', 30', 40' lengths.
1—65" 3 roll Padder, pneumatic.
2—Pneumatic Quetches, 60" face.
1—50" 20 ton Embossing Calender, spare rolls.
2—80" Double Acting Nappers.
1—66" Hinnekens Boil-off.
1—70" Palmer, 68" blanket.
2—Singers, 60", 70".
1—Selvedge Marking Machine.
2—74" Emco Circular Knife Batchers.
2—Semi Decators, 54" and 72".

Also: Office, Laboratory and Maintenance Equipment.

10—Print Machines, 6 to 10 colors, 40" to 64" widths.

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1—Butterworth Tenter Frame 70' long x 200" wide complete with tension bars, take off, Housing 37' x 20' x 7'6", turbine blowers, produce 300 degrees F., and Chromelux setting unit, 213" rods, 450 degrees F., blowers, fans, etc.
1—6' & 3—4' x 9' x 30" Stainless Steel Dyebecks with set of Riggs Lombard pneumatic Squeeze Rolls, 7½" diameter stainless Steel bottom roll and rubber top roll.
4—Stainless Steel Dyetrucks, 302 x 362 x 29" deep with rubber wheels.
2—Werner 72" Totally Enclosed Stainless Steel Dye Jiggs, motorized.
1—5 Color R.B.&F. Printing Machine, complete with Backrigging, Dry Cans, motor, etc.
1—30' x 72" Butterworth Tenter Frame.
1—40' x 54" Winsor & Jerauld Tenter Fame #7 High Speed Chain.
1—72" 2 Roll Simpson Cut Off Winder.
2—90' x 50" Winsor & Jerauld Swing Tenters, #5 Stainless Steel Clips.
Reeves Drives, All Sizes, Opened and Closed.
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1—Sipp E. Hy Speed Warper 83".
2—60" Waldron Coating Heads
2—Air Perme-ator Humidifier Units.
1—VV 3 Roll Calender 60"
51—Spdle Whitin Schweiter Auto Quillers.
1—RB&F 44" 5 color print machine.
1—Hinnekins Moire Calender 50" New.
1—Hercules Extractor 50" Copper Basket
2—88 Tru Shade 6' Dye Tubs, with 88 Hoods
1—Johnson Sizer, 5 Copper Cans 60" Wide.
1—Ingersol Rand 75 HP Air Compressor.

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1—Kearny Textile Psychrometer
1—Cambridge Surface Pyrometer
3—10" Scott Twist Counters
1—Cenco Chemist Balance Scale
3—B. & S. 54" Yarn Reels
1—U. S. Flammability Tester

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1—C. & M. 4-Blade 50" Shear
1—Terrell Type L Bobbin Stripper
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1—C. & M. 48" Vertical Brusher
4—Abbott 100 Spindle Auto. Quillers
2—Abbott #64 Cone Winders

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2x1 BOX 8 HARNESS CAP. MOTORIZED 3 HP/440 volts/60 cycle motors.

STAINLESS STEEL EXTRACTORS

60" Tolhurst
2—48" Fletcher—1953—1958
1—30" Fletcher
1—30" Troy—1952

REINER 64"—DIRECT WARPER
COMPLETE — WITH 50 WOODEN SECTION BEAMS

2—MODEL 550—1957 SUPERLOFTS

GESSNER—HI-TORC—1954

NAPPER DOUBLE ACTING **80"**

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MODEL 44—40 SPINDLE ROTOCONER

6—FLETCHER NARROW FABRIC LOOMS
1953-55—9 FT.—D.D. CIRC. BATENS

CONT. '54 BLEACHING RANGE Wiesner-Rapp Saturated with Belco S.S. J. Box

24 REBUILT MODEL 50 CONERS

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10. U. S. REDRAWS . . .

52 SP. EACH—HI SPEED—SPINDLELESS
Hen. Tensions—1 lb. Cap.

V.V.—1957 CLIP TENTER FRAME
20 FT.—24" TO 72"

3—ABBOTT AUTOMATIC QUILLERS
LATE—60 & 100 SPINDLES

16—1953 FLETCHER TAPE LOOMS

2—S.S. 250 LB PADDLE DYE MACHINES

1—S.S. 150 LB PADDLE DYE MACHINE

1—WHITIN NOV. 200 SP. TWISTER—3" RING

2—HENRICI—ST. STEEL 2 COMP. WASHERS

2—HENRICI—ST. STEEL 3 COMP. WASHERS

2—SIPP EASTWOOD MAG. CONE CREELS

22 DYE BECKS

Stainless Steel—Open & Closed
From 2 Ft. to 16 Ft. Wide
From 32 to 60" Deep

1—OBERMIER PACKAGE DYE UNIT consisting of:

2—500 lb. stainless steel Dye Machines
1—300 lb stainless steel Machine
4—Stainless steel Carriers for 500 lb. Machine
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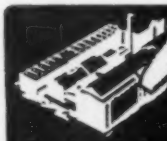
1—New Gaston County static pressure Rapid Dryer and Extractor



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Like New

1270 CFM 40 psi 19x13 Ing. ES-1
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2200 CFM 100 psi 26/15x18 CP-OCE
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2600 CFM 45 PSI
20-20 x 14 Ing. Rand XRE
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Dell & Tex Streets — North Bergen, N. J.

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1—Whitin 3 cyl. 60" x 60" Woolen Card, Year 1947, T-Slot, Peralta, Double Rubb tape, M.D.

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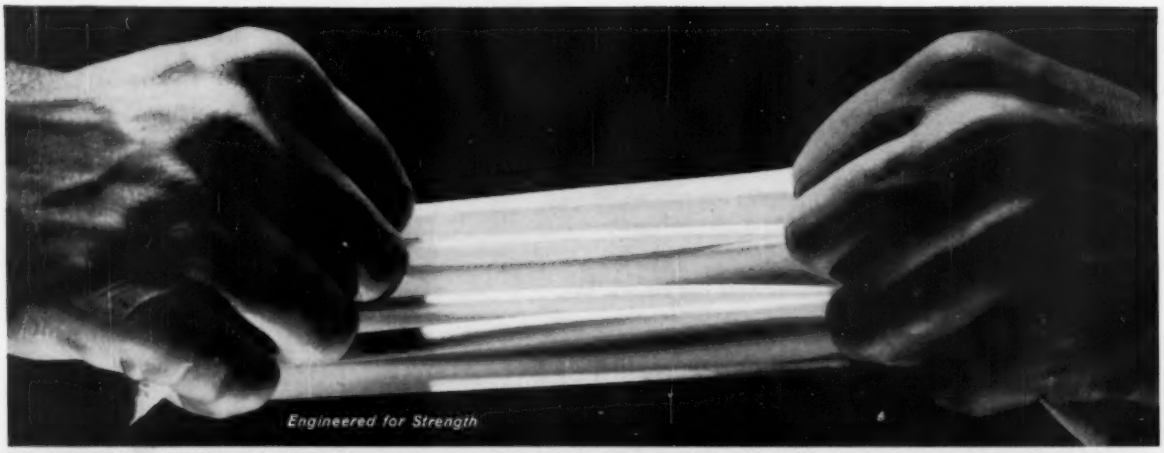

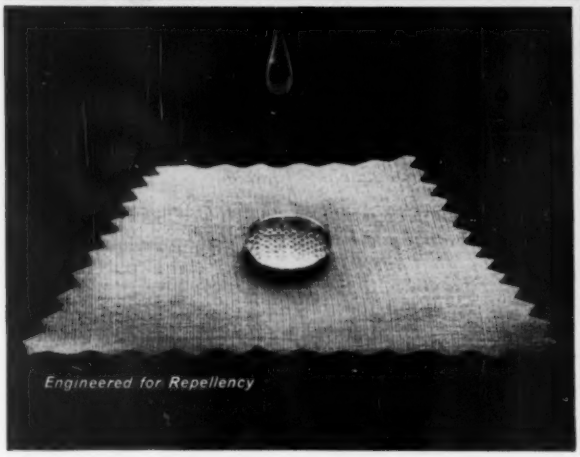

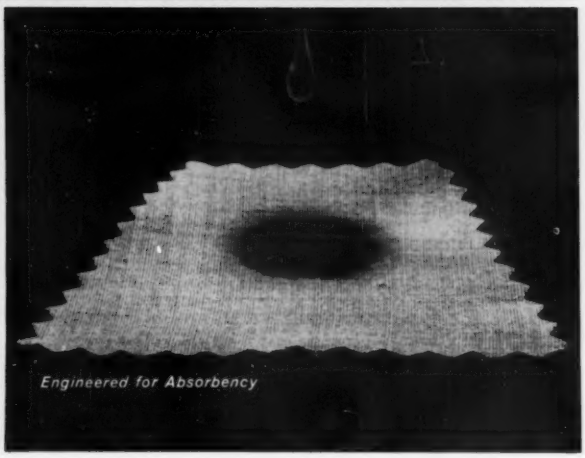

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